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DEPARTMENT OF TRANSPORTATION

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SAFETY RULES FOR SELF-PROPELLED VESSELS CARRYING HAZARDOUS LIQUIDS

Title 46—Shipping

CHAPTER I—COAST GUARD, DEPARTMENT OF TRANSPORTATION

[CGD 73-96]

SAFETY RULES FOR SELF-PROPELLED VESSELS CARRYING HAZARDOUS LIQUIDS

AGENCY: Coast Guard, DOT.

ACTION: Final rule.

SUMMARY: This amendment revises safety regulations for all self-propelled vessels operating in U.S. navigable waters and self-propelled U.S. vessels in other waters while engaged in the carriage of certain bulk dangerous liquid cargoes. The growing frequency of hazardous chemical shipments in bulk cargo tanks has increased the crew's exposure to cargo hazards and the potential for their release due to accident. This rule will reduce exposure of the crew and people near the vessel to these cargo hazards. The requirements have been chosen to be practical, and economically and technically feasible. The amendment adopts (with some extensions) the recommendations contained in the IMCO Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (Resolution A.212(VII) as amended).

EFFECTIVE DATE: December 27, 1977.

FOR FURTHER INFORMATION CONTACT:

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SUPPLEMENTARY INFORMATION: On June 24, 1976, the Coast Guard published a proposed rule (41 FR 26126) to revise the regulations governing self-propelled vessels carrying certain bulk dangerous liquid cargoes. Interested persons were given until August 20, 1976 to submit comments. A public hearing was held in Washington, D.C., on August 3, 1976.

Drafting Information

The principal program person and lawyer involved in the drafting of this rulemaking are Mr. Robert M. Query, Project Manager, Office of Merchant Marine Safety and Mr. Michael N. Mervin, Project Attorney, Office of Chief Counsel.

Discussion of Major Comments

GENERAL COMMENTS

The Coast Guard received seven comments of a general nature. The National Transportation Safety Board (NTSB) noted that "* * * a significant risk will exist until the qualification procedures (for the person in charge of cargo transfer operations) are adopted." As noted in the preamble of the proposed rule, the Coast Guard published a Notice of Proposed Rulemaking describing the qualifications a person must have before being designated the person in charge of cargo transfer onboard a chemical tankship (See "Tankerman Requirements," CGD 74-44, 42 FR 21190). The final requirements will be published shortly.

The NTSB further recommended that "* * * the owner's responsibilities for manning the vessel, for the equipment on the vessel * * * (and) the method he should use to indoctrinate the crew to the vessel's systems and to cargo handling procedures" should be included in the rulemaking. Both the notice and final rule describe the owner's responsibility for the equipment on the vessel and the standards the vessel must meet before obtaining a permit endorsed for a particular cargo. The owner's responsibility for manning a vessel is described in Coast Guard regulations located elsewhere in Title 46. Due to the many and varied types of tankship chartering agreements employed today, the owner is generally not the person most familiar with the systems and cargo handling arrangements installed on his vessel. The ship's officers are usually the most familiar with these aspects of the chemical tanker and are in a much better position to indoctrinate the crew than the owner.

Because the ship's officers are themselves responsible for the operation of the chemical tanker under the new rule, they will provide the crew with the instruction necessary to assure the safe transfer of cargo. To facilitate safe cargo transfer, an additional requirement has been incorporated into the operations sections of the final rule. It requires the person in charge of cargo transfer on the tankship to confer with his counterpart ashore before commencing cargo transfer operations.

The NTSB also recommended that each tankship should be required to have an operating manual which describes in detail the procedures involved in operating the liquid transfer systems. The Coast Guard agrees that some specific information on cargo transfer operations may be helpful to the person in charge of cargo transfer. The operating sections have been amended to require a piping diagram that shows the cargo piping, valves, pumps and any other important components of the cargo containment system. A detailed operations manual, as suggested, that describes every possible valving and piping arrangement would be extremely complex and awkward to use on most vessels. However, the Coast Guard has proposed requirements for a reasonably detailed operations manual in part 35 (see 42 FR 23517). These requirements will apply to vessels certificated under part 153.

Finally, the NTSB recommended that the Coast Guard limit the hours of duty for the people involved in cargo transfer operations. This recommendation falls outside the scope of the material presented in the notice of proposed rulemaking but will be considered for inclusion in the appropriate section of the regulations.

REQUIREMENTS FOR EXISTING VESSELS

The American Institute of Merchant Shipping (AIMS) requested clarification of several points in § 153.7 of the proposal dealing with existing vessels. The Coast Guard has redrafted this section in a second notice of proposed rulemaking discussed later. The redrafted section should clarify these points.

AIMS also forwarded to the Coast Guard the comments of the International Chamber of Shipping (ICS), a group representing, among others, international tanker operators. ICS objected principally to the fact that the Coast Guard proposed standards that exceeded the IMCO Chemical Code in some instances. ICS noted the Coast Guard's participation in developing the IMCO Chemical Code and its support of the adoption of the Code by the IMCO General Assembly in October 1971. ICS feels that the Coast Guard, by going in excess of the Code's requirements in certain instances, is reneging on its support of the IMCO Chemical Code. ICS also commented on the fact that the time period within which existing ships must comply with the rule differs from the timetable prescribed by the IMCO Chemical Code. Several sections of the final rule have been modified to give the Coast Guard wider latitude in its acceptance of equivalent designs than the proposal permitted. One example is the requirement that wheelhouse windows must be tight when tested with a firehose rather than dogged and gasketed.

Since adoption of the Chemical Code the Coast Guard has recommended numerous changes to IMCO. Many of these have been approved as amendments to the Code and will most likely be adopted shortly. However, IMCO intends to amend the Chemical Code only once every two years. Considering the time necessary to put such amendments into effect, a vessel might be operating in U.S. waters for four or more years using techniques and equipment the Coast Guard feels are possibly unsafe. The laws under which the Coast Guard is issuing this rule require that all vessels in U.S. navigable waters operating under the rule meet essentially the same standards. For these reasons, the rule contains standards that in some cases exceed those of the IMCO Chemical Code, even though the Coast Guard has attempted to keep such instances to a minimum.

Section 153.7(c) of the proposal contained a series of dates and section numbers describing the schedule an existing ship would be allowed to follow if it were modified to operate under the new part. This schedule would have extended over a period of approximately five years, so that a ship would have met virtually all the requirements in the proposal by sometime in 1982. A number of people commented on § 153.7(c), mostly on how quickly a ship would have to meet a particular section or whether it would have to meet a section at all.

However, several comments noted that the Coast Guard was, as a practical matter, changing the effective dates of the IMCO Chemical Code. These people argued that the proposed rules would allow ships not following the Code to continue to operate without modification until 1982, whereas those ships which were complying with the Code would have to be modified by April 12, 1978.

This would give an unfair advantage to ships not meeting the Code. Comments also pointed out that the Code was published in 1971 so that the marine chemical shipping industry has had ample notice of the Code's timetable for upgrading.

The Coast Guard reviewed the design of existing chemical ships under U.S. flag and those foreign ships operating in U.S. waters when it assessed the economic impact of the original proposal. The Coast Guard determined that most U.S. flag and many foreign flag ships carrying hazardous chemicals either already comply with or are close to complying with the requirements in part 153. The Coast Guard's estimate of the cost of the original proposal, including existing and new, foreign and U.S. flag ships showed that the cost per year for the first five years (during the period existing tankers were being converted) would be roughly $3,000,000. If the total cost were compressed into one year, it would amount to about $15,000,000, ignoring any inflationary increase since the original evaluation in the spring of 1976 and disregarding costs from lost operating time and shipyard scheduling problems.

After considering the various objections to the time schedule in the original proposal and the costs involved in meeting the schedule for conversion prescribed by the Chemical Code, the Coast Guard determined that the schedule in the proposal should be modified to coincide with that in the Chemical Code. However, since this change represented a significant departure from the original proposal, the Coast Guard issued a second Notice of Proposed Rulemaking on effective dates for existing ships (see 42 FR 23518).

The Coast Guard received two comments on the proposal to change the effective dates for existing ships. One comment, received after the closing date for comments, did not address the subject of the notice but rather differences between the location of deckhouse openings on chemical tankers, liquified gas tankers, and petroleum tankers. The Coast Guard recognizes these differences and has brought the apparent anomaly to IMCO's attention. Work at IMCO is currently underway to harmonize the various Codes as much as possible, and the subject of deckhouse openings will be included.

The second comment concerned an older foreign flag vessel that was to be phased out of operation in the near future. According to the comment the change in effective dates might force this vessel out of operation sooner than expected. However, the comment did not describe in what ways the vessel would fail to meet the new rule, nor how close the vessel was to meeting any standards it failed to meet. The Coast Guard believes any realistic problems can be resolved under § 153.7(c)(6). Therefore, the change in effective dates for existing ships is incorporated in this rule.

One comment suggested that the Coast Guard adopt the IMCO Code verbatim rather than publishing a separate regulation containing the IMCO recommendations. The same comment noted that the IMCO Chemical Code was developed long before this rule was published and for that reason it would appear "* * * that foreign experience should be far ahead of the U.S. flag experience." As previously noted in the preamble of the proposal, the Chemical Transportation Industry Advisory Committee (CTIAC) in cooperation with the Coast Guard began developing the proposed regulations in August, 1968, and completed their recommendations at about the same time the IMCO Chemical Code was adopted in 1971. In the administration of the Letter of Compliance program, the Coast Guard has had about the same amount of experience using the requirements in this rule as it has had using the requirements in the IMCO Chemical Code.

As is the case with many codes and recommendations, the IMCO Chemical Code is not sufficiently detailed in many instances to be used as a regulation. Moreover, the Code's provisions, being written in the form of recommendations, are not suitable as regulations. For these reasons the Coast Guard is required to publish a rule incorporating the Chemical Code rather than to publish the Chemical Code as the rule itself.

The Maritime Administration recommended that the Coast Guard consider incorporating within this rule part of the requirements from 33 CFR Subchapter O that apply to oil pollution prevention. The laws authorizing the Coast Guard to publish this rule are clear in requiring that pollution and safety rules be distinguished. The Coast Guard will develop rules covering chemical pollution but must wait for the Environmental Protection Agency to identify "hazardous substances" in accordance with the Federal Water Pollution Control Act or until ratification and coming into force of the 1973 Marine Pollution Convention.

The Maritime Administration also recommended that the Coast Guard specify a minimum intensity of deck lighting in the cargo transfer area as is now specified in 33 CFR 155.790. The Coast Guard is now in the process of developing regulations that will prescribe requirements for waterfront facilities handling bulk liquid chemicals. Minimum lighting standards for the cargo transfer area will be included in these regulations.

The American Bureau of Shipping (ABS) noted that the proposal would apply to cargoes carried in the deep tanks of chemical tankers and vessels other than chemical tankers. ABS felt that such a requirement on deep tanks is premature. The Coast Guard and IMCO are studying the question of deep tanks and expect to develop standards for these eventually. Because the volume of cargoes carried in deep tanks is quite small at present and because many of the cargoes listed in the proposal would be difficult to carry safely in deep tanks, the Coast Guard will continue to evaluate these situations on a case by case basis.

Several people commented that the term "senior deck officer" does not refer to a specific person but may be the master, chief mate, or whichever officer is in charge of the vessel at any particular time. To clarify whom we are talking about, and to ensure that the master of the tankship is responsible for seeing that the operational responsibilities under his supervision are followed, the term has been changed to "master". To enable the master to delegate his authority to another responsible person if he wishes, the phrase "the master shall ensure that" is used throughout the rule.

COMMENTS ON SPECIFIC SECTIONS

Changes to existing parts. Some of the revisions in sections of other regulations included in the proposal to conform with part 153 were modified to accommodate a revised 46 CFR part 154 that will deal with liquefied gases.

Although the proposal included changes to 46 CFR part 2 dealing with the Hazardous Materials Incident Report, the Coast Guard decided to cancel this report altogether (42 FR 41636).

Section 153.2 Definitions. The definitions contain five new terms: "accommodation spaces," "Commandant," "dedicated ballast tank," "master," and "service spaces." Several of the definitions are the same as proposed in the rules for liquefied gases (41 FR 43822), and each of the definitions should help clarify the rule.

Two comments were received regarding the definition of "independent tanks". One comment suggested that rather than defining integral and independent tanks, the rule should distinguish only between tanks separated from the sea by an intervening space and those that allow the cargo to contact the vessel's side shell or bottom plating. An independent tank is one that has special supports that prevent it from being stressed by the loads on the tankship itself. An independent tank is not only separated from the sea but is also not as likely to leak as an integral tank, regardless of whether the integral tank is surrounded by void spaces. The Coast Guard requires independent tanks in instances where cargo leakage would pose an unusually hazardous condition or where some property of the cargo would make an integral tank impractical. For example, motor fuel antiknock compound, if leaked from a tank, would be extremely difficult to clean out of a void space or wing tank separating the tank from the sea. Therefore, the Coast Guard requires an independent tank to reduce the chance of cargo leaks.

Another comment asked whether a tank whose foundation was welded to the hull or which had one bulkhead formed from one of the ship's transverse bulkheads would be considered independent. The Coast Guard does not consider such tanks to be independent because in both cases the tanks would be forming part of the vessel's hull and would be subject to the same stresses as the vessel's hull. The definitions of integral and independent tanks have been reworded to clarify the difference between the two.

One person recommended that a definition for "designated ballast space" be

added to the rule. This phrase is not used in the proposed rule; however, the phrase "dedicated ballast tank" is used. A dedicated ballast tank is a tank within the vessel used only for clean ballast. The Coast Guard has added this definition to the final rule.

Section 153.7 Existing tankships. The Maritime Administration recommended that section 153.294(a) of the proposed rule, requiring piping systems to be marked with the name of the tank they serve, be made effective immediately since it is not a difficult requirement to meet and is useful from a safety standpoint. The Coast Guard agrees with this suggestion and has made section 153.294 effective immediately for existing vessels by adding it to section 153.7(c)(1).

Another comment noted that proposed section 153.7(c)(5) incorrectly implied that a type I containment system on an existing vessel could have a bottom shell clearance less than type II containment on the same vessel. This section has been changed so that existing type I and II containment systems must both be at least 76 cm from the bottom shell of the vessel.

One comment recommended that proposed sections 153.202 and 153.258 not be required of existing tankships. These sections set forth location requirements for doors, airports and the separation distances of cargo tanks from machinery, service and other spaces. In response, the Coast Guard has deleted the 76 cm separation distance contained in proposed section 153.258. This section has been reassigned to section 153.233 in the final rule. It now contains the same provisions as set forth in the IMCO Chemical Code. Existing vessels should have little difficulty meeting the requirements of this section since segregation has been a tankship design requirement for many years. Furthermore, existing vessels certificated under the IMCO Chemical Code will also have to meet this same requirement by April 1978.

Section 153.9 Foreign flag vessel endorsement application. This section, describing measures a foreign vessel must take to get a Letter of Compliance, now includes two certificates under the Safety of Life at Sea Convention. These certificates are necessary to show the vessel meets the Coast Guard's tanker requirements under subchapter D.

The proposed rule may have implied that submitting an IMCO Certificate was optional. The wording of section 153.9 has been changed to make it clear that the owner of a vessel registered in a country that issues IMCO Certificates must submit a copy of the IMCO Certificate in order to receive a Letter of Compliance.

Section 153.12 IMCO Certificates. A new section 153.12 is added to explain under what conditions the Coast Guard issues an IMCO Certificate to a U.S. tankship. The IMCO Certificate shows that the U.S. flag tankship meets the recommendations of the IMCO Chemical Code.

Section 153.30 Permeability of spaces. When the Coast Guard proposed the rules for liquefied gas tankers in part 154, it described the limits it places on permeability assumptions when assessing a vessel's stability after flooding in greater detail than it did in the proposal for this part. To aid ship designers in understanding the Coast Guard's vessel stability requirements, the more detailed description of permeability assumptions set out in the proposal for liquefied gas tankers is included in § 153.30. Sections 153.31 and 153.34 also have been made more detailed for the same reason.

Section 153.32 Damage. One comment suggested that proposed section 153.32(a)(1)(ii) should allow a collision penetration to be calculated from the highest deck level rather than at the assigned loadline so that the protection provided by the flare found at the vessel's bow could be utilized. The same comment stated, with no explanation, that theoretical bottom damage should be based on the vessel's depth rather than it's beam. In both cases, the penetration measurments used were taken from correlations derived from accident statistics. They are convenient reference points from which to describe the penetrations found in IMCO's analysis of accident data, rather than being theoretical deductions. If the Coast Guard had not adopted these recommendations, U.S. flag ships would not meet the minimum requirements of the IMCO Code.

Section 153.200 Portlights, wheelhouse windows, and wheelhouse doors. The proposed requirements for locating openings in superstructure, section 153.200, came from the Chemical Code. This section of the final rule was reworded to clarify the requirements and match the wording of the Chemical Code more closely.

Section 153.202 Location of deckhouse doors and airports. One comment argues that this section and the corresponding section of the IMCO Chemical Code should be written differently. The comment maintains that the purpose of this rule is to keep openings into the deckhouse clear of the cargo space regardless of the location of the accommodations house front and that, for this reason, the measurements should be made from the after transverse bulkhead of the cargo space. The purpose of this requirement is to reduce the possibility of toxic and flammable vapors being trapped in accommodation spaces bounding the deckhouse front. Vapors that are swept against the house front would be free to enter open portlights and doors if it were not for this design requirement. Taking measurements from the end of the cargo containment system, as suggested, would have no effect on minimizing this particular hazard.

Section 153.208 Ballast equipment. One comment said that proposed section 153.208(b)(2) was too restrictive in requiring that a non-return valve be located at the point where the ballast fill line enters the ballast tank. We agree. This section has been modified to allow either a stop value and a check valve or a stop-check valve to be used and to allow this valving arrangement to be located anywhere in the cargo containment area so long as it is not located within a cargo containment system.

Section 153.214 Personnel emergency and safety equipment. Two comments pointed out that the protective clothing described in proposed section 153.214(b) was too specific and would not insure adequate personnel protection from many corrosive or toxic cargoes. This section has been modified to broaden the description of the protective clothing while at the same time requiring it to be made of chemically resistant materials. Other comments suggested changes to § 153.527 as well as this section to require that the respiratory equipment and first aid kits be approved by the Mining Enforcement and Safety Administration and the National Institute for Occupational Safety and Health, or similar foreign organization. This suggestion has been adopted. The respiratory equipment has also been described in greater detail to exclude a type that can be hazardous if used incorrectly; the respiration equipment now must be ". . . a portable oxygen inhalation and bag valve mask manual resuscitator."

One comment suggested that the safety equipment lockers required by proposed 153.214(c) should be located in a protected area. While moving these lockers into protected areas may make them less subject to damage, the lockers would also be less available in an emergency. The lockers themselves should sufficiently protect the safety equipment and this requirement has not been changed. Another comment noted that proposed section 153.214(f) did not require the shower and eye wash fountain to operate at any ambient temperature. This suggestion has been incorporated in section 153.216 of the final rule.

Section 153.217 Access to void spaces. A section 153.217 is added that requires access openings to void spaces adjacent to cargo tanks to be the same minimum size as openings to cargo tanks. These void spaces may easily have cargo vapors within them so that a man wearing self-contained breathing equipment should be able to get in them.

Section 153.230 Type I system. One person commented that this section appeared contradictory in that a type I cargo containment system would have to be located 76 cm in from the vessel's shell while also having to be inboard a distance of B/5 at the assigned loadline. However, depending on the curvature of the hull at the tank location, a straight-sided tank located a distance of B/5 inboard at the loadline might be only 76 cm from the hull where the hull turns inward near the turn of the bilge. This section is not contradictory and has not been changed.

Section 153.235 Exceptions to cargo piping location restrictions. One comment stated that the exceptions contained in this section could result in placing the cargo piping in a poor location. This allowance is also included in the IMCO Chemical Code, and permits cargo piping to be located closer to the vessel's shell than a cargo tank, provided that the piping is designed in such a way that no cargo release will result in the event of a collision. This piping location would not

present a hazard and may offer some flexibility to the designer. The section has been modified slightly to more clearly reflect its purpose.

Section 153.236 Prohibited materials. In volume 42 number 28 of the FEDERAL REGISTER dated February 10, 1977 on page 8377 the Coast Guard published a final rule modifying the restrictions in 46 CFR 151 on the use of certain materials in containment systems on barges carrying caustic soda and caustic potash. In the preamble, the Coast Guard noted that "there are some data that show that copper alloys with a high zinc content are attacked by caustic." The Coast Guard restricted the use of alloys containing more than 10 percent zinc by weight at that time. This section has been modified to adopt this restriction.

Section 153.258 Tank separation. This section was moved to section 153.233. The entire section was redrafted in an attempt to clarify some of the ambiguities described in several comments. One comment said many existing small tankships will not meet the proposed requirement. Section 153.233, as written in the final rule, is a standard that U.S. tankships have been required to meet for many years and is also an IMCO requirement. The Coast Guard will not exempt existing vessels from this requirement.

Section 153.280 Cargo transfer valving. In response to several questions received regarding the group of sections entitled "Cargo Handling Equipment" in the proposal, this area has been reorganized for clarification. This particular section has been redesignated as section 153.283 and slightly modified to require that a valve be located within each tank a cargo line serves.

Section 153.294 Marking of piping systems. One comment asked whether the cargo piping system should not be marked at more than one location. This section is modified to require that the cargo piping system be marked at each hose connection and at each valve and blind flange in the piping system. This modification should aid in preventing mistakes in tank loading.

Section 153.296 Emergency shutdown stations. One comment recommended that this section be modified to require an emergency shutdown station at the point where cargo transfer is controlled. The Coast Guard agrees with this recommendation and has made the change. Another comment recommended that the power shutdown control in the engine room be acceptable as one of the required emergency shutdowns. Since such a control would be nowhere near the point of cargo transfer and would be awkward to get to in an emergency, the Coast Guard will not accept this as one of the shutdown stations. This section of the final rule contains an additional requirement: emergency actuators must not interact with one another in a way that could prevent operation of the other emergency systems.

Section 153.330 Access. One comment stated that the ANSI standard for industrial stairs referred to in this section of the proposal was inappropriate and conflicted with other parts of the same section. Reference to this standard has been dropped from the final rule. One comment objected to the requirements for guard railings on ladders and platforms. The same comment also found the ladder inclination requirement "difficult and costly." The Coast Guard finds it somewhat difficult to believe that a requirement for guard railings and limitations on the inclination of ladders would have a significant financial impact on a ship costing 40 to 50 million dollars. Except where mentioned, this section has not been changed.

Section 153.361 Arrangements for removal of valves from venting systems having multiple relief valves. Included in the final rule is this new section that allows the use of vent systems with multiple relief valves which can be removed for servicing without taking the cargo tank out of service.

Section 153.404 Containment systems requiring closed gauges. Several sections describing requirements for cargo gauging systems were reorganized for clarity. The requirement for a high level alarm system, originally described in section 153.404 of the proposal, has been separated from the other requirements for closed gauging systems and redesignated section 153.409.

One comment recommended that the Coast Guard review its proposal to require vapor return connections on cargo tanks endorsed for cargoes having the greatest vapor hazards. This recommendation is based on the belief that a number of these cargoes are now being transferred without using vapor return and without creating any "* * * problems whatsoever." The Coast Guard's purpose in proposing this requirement was to minimize the amount of hazardous vapor discharged during cargo loading. Since many of these vapors pose chronic toxicity hazards that may take effect only after long periods of time, their dangers may not be immediately obvious to persons conducting cargo transfer operations. It is for this reason that the Coast Guard is retaining these requirements as proposed.

The same person suggested that the high level alarm and the tank overfill control system should be actuated at the same level. He recommended that 98 percent of the tank's capacity be used in each case but offered no reason for this comment. The high level alarm is provided to alert personnel filling cargo tanks than an immediate corrective action is necessary. The one percent set point difference, as provided in these sections, will give the operator sufficient time to take corrective action before the loading operation is automatically terminated. Both the high level alarm and the overfill control system are provided as safety devices in the event of personnel error or a failure of the required tank gauging system. Routine and frequent use of these backup devices is undesirable from both an operational and safety standpoint. For these reasons the Coast Guard did not change the proposed rule.

Section 153.406 Containment systems requiring restricted gauges. One comment recommended that the restricted gauge maximum diameter should be increased because 5 cm would be too small to allow accurate gauging of cargo tanks of 30 to 40 feet in depth. The maximum diameter has been increased to 20 cm, which has been found to be sufficient to allow gauging of a tank that is 40 or more feet deep.

Section 153.407 Special requirements for sounding tube gauges. In response to several comments, this section has been expanded to describe the requirements for sounding tube gauges in more detail. Sounding tubes will now be required to extend to within one meter of the tank bottom. This requirement will minimize the amount of vapor escaping through the tube during tank loading operations.

Section 153.408 Tank overfill controls. One comment recommended that a 30-second maximum closure time for quick-closing valves be allowed after the cargo tank has reached the 98 percent level. The intent of this requirement is to assure that the shutdown valve is completely closed by the time the tank level reaches 98 percent. Therefore, it is not necessary to specify a maximum closure time. The final rule was reworded slightly to clarify this point.

Section 153.432 Cooling systems. One person commented that this section should also describe the size of the backup units and how readily they must be placed in operation. Paragraph (b) has been rewritten to insure that the standby refrigeration equipment is installed and ready for immediate use. Paragraph (c) was also added; it requires a piping diagram for the refrigeration system and instructions on changing over to the standby unit.

Section 153.438 Cargo temperature alarms required. One comment argued that the cargo high temperature alarm should not be required to be located on the bridge but only to be audible and visible from the bridge. The Coast Guard has not modified this section because in many circumstances, such as when the vessel is underway, a person on the bridge of the vessel might not be able to hear the cargo high temperature alarm or see it if it were located only on the deck of the vessel. It is important that the alarm be immediately recognized and corrective actions be taken.

Section 153.440 Cargo temperature sensors required. One comment recommended that section 153.440 be rewritten to allow a thermometer well on the tank rather than having a remote sensing thermometer located at the point from which cargo transfer is controlled. The comment pointed out that remote reading temperature indicators are unreliable and that the requirement as applied to elevated temperature cargoes affects only the quality of a cargo and not the safety of the vessel or crew. Overheating of cargo can often create safety problems as well as affecting cargo quality. Furthermore, heating a cargo beyond the temperature for which a tank is designed can cause a tank to crack and leak or can raise stresses in main structural mem-

bers within the vessel beyond the values they were designed to accommodate. This problem has appeared to be involved in some past accidents with sulfur carriers. For these reasons the Coast Guard has retained the requirement, though modifying it slightly to require only two rather than three remote reading temperature sensors on each tank.

Section 153.460 Fire protection systems. A number of people commented on the fire protection requirements described in section 153.460. These comments can be summarized as follows:

a. The section on fire protection systems refers to part 34 of title 46. Part 34 contains no standards for dry chemical fire protection systems.

b. Water spray systems are ineffective in controlling a fire and the requirement should be changed to foam spray systems.

c. Dry chemical systems are ineffective in controlling flash back and reignition.

d. A category of fire protection systems requiring AFFF fire fighting agent should be created.

e. Dry chemical agents are ineffective in controlling cargo vapor.

f. The regulations would allow a dry chemical system to be substituted for any other fire protection system specified. Dry chemical systems may not be effective with many of the cargoes. This provision should be changed to require only approved type fire protection systems.

The objections to dry chemical systems are generally correct. The proposal would have allowed substitution of dry chemical for a type A or B system, (and mistakenly for a type C system) apparently at the choice of the designer. Because of the many considerations involved in substituting dry chemical for other systems, and since standards for dry chemical systems do not exist in part 34, the regulations have been revised. Section 153.460 now requires that a dry chemical system substituted for a type A or B system must be specially approved, by the Commandant (G–MMT). The Coast Guard will publish rules for dry chemical systems on chemical tankers in a future rulemaking.

Water spray systems are generally ineffective in controlling a fire, and are not usually prescribed for fire extinguishment purposes. They are effective, however, in cooling exposed tanks and piping and in preventing reignition of cargo vapors after a fire is out. Therefore, water spray systems are still required for some cargoes.

The Coast Guard has not added a category requiring AFFF agents. These agents are not unique in being effective on both regular hydrocarbons and polar solvents since all Coast Guard approved polar solvent foams are suitable for regular hydrocarbons as well. The terms "alcohol" and "regular foam" have been deleted from the footnotes to table I, since they may be subject to misinterpretation.

Section 153.463 Vent system discharges. One comment objected to the 10 meter separation distance required between cargo tank vent discharges and ignition sources. This section has been revised to apply only to those cargoes requiring PV venting, a provision contained in the IMCO Chemical Code.

Section 153.465 Flammable vapor detector. In keeping with the IMCO Code, this section was modified to permit one of the two required flammable vapor detectors to be the permanently installed type.

Section 153.466 Electrical equipment. This new section was added to ensure that all electrical equipment meets the provisions of Subchapter J of Title 46.

Section 153.467 Ventilation systems for flammable cargoes. This new section requires non-sparking ventilation equipment for all flammable cargoes. This was added because the Coast Guard actually reviews ventilation equipment on tankers carrying any flammable cargo to see that the equipment is non-sparking. To mention the requirement only under alkylene oxides as was done in the proposal would have been misleading.

Section 153.500 Inert gas systems. One comment objected that the proposal required that isopropylamine, toluene diisocyanate, and vinylidene chloride be inerted when carried. Toluene diisocyanate is carried with an inerted, pressurized vapor space to prevent water vapor from entering the tank. The Coast Guard had intended to include for toluene diisocyanate the requirement that the inert gas system supply inert gas with no more than 100 parts per million water. This requirement was contained in section 153.501, and was omitted in table 1 of the proposal. Toluene diisocyanate decomposes when mixed with water and releases carbon dioxide. If much water vapor, such as might come through an inert gas system supplying scrubbed stack gas, mixed with the cargo, the rate of carbon dioxide evolution might be greater than the tank venting equipment could handle, overpressuring the tank. The Chemical Code requires that normal propylamine and vinylidene chloride both be inerted. Since isopropylamine and normal propylamine differ only slightly in the characteristics that make inerting important, such as autoignition temperature, flammable limits, and reactivity with air, the Coast Guard proposed that isopropylamine also be carried under an inert gas pad. The Coast Guard will review with IMCO the requirement that these cargoes be inerted; however, in the interim the requirement will be imposed.

The comment further recommended that the requirements for inert gas systems be modified to allow part of the system's capacity to come from auxiliary inert gas supplies on shore during cargo discharge. This is a reasonable alternative so long as there are operational controls to prevent a tank's vacuum relief valve from operating when discharging a cargo required to be inerted. Therefore, the Coast Guard has modified section 153.975 to add an operational requirement that any necessary auxiliary inert gas supplies be connected before cargo discharge.

One comment remarked that the Coast Guard's proposal to require about 14 kiloPascal (kPa) gauge pressure of inert gas within a tank is excessive. He suggested that a pressure of about 1.75 kPa would be sufficient, would cut down on inert gas use, and would decrease the amount of cargo vapor vented. The Coast Guard agrees that the inerting pressure of 14 kPa is excessive and has modified this requirement to make the minimum inert gas pressure in the tank equal to the minimum pressure at which a tank relief valve may begin to open, that is, 3.5 kPa.

The Maritime Administration suggested that in order to specify the volumetric flow capacity of the inert gas system accurately, the pressure at which the volumetric flow capacity must be computed should be specified. The Coast Guard agrees and has modified section 153.500(d) to specify that when calculating the system's flow, the gas be at 46°C and 3.5 kPa pressure.

Section 153.520 Special requirements for carbon disulfide. Paragraph (d) of the carbon disulfide requirements was modified slightly to specify a type 304 or 316 stainless steel on the pv valves instead of the unspecified type in the proposal.

Section 153.525 Special requirements for unusually toxic cargoes. Two comments suggested changes to the requirements for toxic cargoes contained in this proposed rule. One comment recommended that section 153.525(d) be changed to read, "be arranged so as not to contaminate other systems via supply and return of heating source". The proposed rule would require an independent heating system or a heating system totally external to the cargo containment system. The IMCO Code is worded similarly, but allows a third alternative in which the heat transfer fluid may be sampled for the presence of cargo before being returned from the tank to the heat exchanger. The Coast Guard will consider systems for sampling the fluid that would prevent circulation of contaminated heat transfer fluid into other heat transfer systems. To clarify this point, a provision has been added to section 153.525(d) of the final rule that will allow such sampling systems, provided they have the approval of Commandant (G–MHM).

One comment objected to the requirement in section 153.525(b) that the relief valve on a cargo tank carrying unusually toxic cargoes be set at no less than 21 kPa. The comment argued that venting a tank at about 2-kPa would relieve a much lesser "volume of toxic vapors". Under normal operating conditions a cargo tank carrying an unusually toxic cargo would release vapors through the vent system only because of pressure changes caused by temperature variations within the cargo liquid and vapor phases. This cyclical phenomenon is commonly referred to as "tank breathing". The amount of cargo released during breathing is a function of the temperature extremes encountered and the pressure setting of the vent system relief

valve. The Coast Guard has set the lower limit on this relief valve setting at 21 kPa to minimize tank breathing by forcing the relief valve to operate less often. If vapor is vented, it will be released a distance of at least 6 meters above the deck where personnel may be working and at a higher velocity than if vented at 2 kPa. This distance and initial velocity should be sufficient to disperse and dilute the vented vapors.

One comment objected to the excessive separation distance required under 153.525(e) between toxic cargoes and bunkers. This section of the proposal is modified to require separation of the cargo and not cargo containment from bunkers by two bulkheads.

Section 153.530 Special requirements for alkylene oxides. One comment recommended that this section include all IMCO Chemical Code requirements and that the Coast Guard review its requirements for propylene oxide in light of its highly flammable and reactive characteristics. Upon review, proposed section 153.530 was revised to incorporate the restrictions on construction materials contained in the IMCO Chemical Code. In conjunction with the Chemical Transportation Industry Advisory Committee (CTIAC), the Coast Guard is continuing a review of its propylene oxide requirements. The Coast Guard is also conducting an active testing program aimed at determining possible reactions between seawater and propylene oxide in the presence of various catalysts, such as rust. Any rule changes that might result from the test program findings or the recommendations of the CTIAC's Subcommittee on Chemical Vessels will be handled in a separate rulemaking.

Section 153.556 Special requirements for sulfuric acid and oleum. One comment asked why the requirements for sulfuric acid did not mention stainless steel as a material of construction. Although the Coast Guard would consider stainless steel equivalent to mild steel in its ability to resist corrosion by sulfuric acid and oleum, the Coast Guard has no evidence that stainless steels are sufficiently more corrosion resistant than mild steel to be useful at all concentrations of sulfuric acid. Therefore, the Coast Guard has left this requirement unchanged and will handle any requests to use materials other than those specified in the section on a case by case basis as described in paragraph (c) of the section.

The proposed rule was possibly misleading in allowing unlined steel to be used for tanks carrying oleum containing more than 4 percent free sulfur trioxide. The 4 percent figure applies only to a method of measuring oleum concentration peculiar to the sulfuric acid industry. As the proposal was worded, this concentration should have been 20 percent rather than 4 percent. Twenty percent free sulfur trioxide is specified in the final rule.

Section 153.806 Stability test and information. One person commented that this section is confusing because it refers to the requirements for Cargo and Miscellaneous Vessels in Part 93 of title 46 when describing the stability tests and information a tankship must have before its Certificate is endorsed. The requirements in part 93 are general in nature and can be applied to any vessel. In fact, the Coast Guard recently proposed to apply these same requirements to tankers certificated under parts 30–35 of title 46. The Coast Guard does not believe this reference will cause confusion once people become familiar with it and, therefore, has left the rule as proposed.

Sections 153.808 through 153.812. Four sections from the existing 46 CFR Part 154 were added in the "Testing and Inspection" group to describe the procedures the owner of a foreign flag vessel must follow to arrange for the Coast Guard to examine his vessel. The new sections describe a systematic procedure to follow to arrange an examination and list the information the Coast Guard needs for the examination. The Coast Guard requires a minimum of 14 calendar days to set up an examination. A vessel that does not have a Letter of Compliance may carry a dangerous cargo into U.S. waters on the examination voyage only if it has specific authorization from the Coast Guard.

Sections 153.900–153.976. Many of these sections have been moved and renumbered to improve the order of presentation.

Section 153.902 Expiration of Letters of Compliance. A section was added to state that a Letter of Compliance, like a Certificate of Inspection, is good for a period not exceeding two years. This is an existing rule in part 154 that is now incorporated here.

Section 153.907 Cargo information cards. One comment stated that the ship's personnel should not be responsible for ensuring that terminal personnel "* * * be knowledgeable of the nature of the products that the terminal handles." By this rule the Coast Guard is not requiring that ship's personnel ensure that terminal personnel be familiar with all the cargoes handled by the terminal, but rather that they ensure that terminal personnel are aware of the products being carried on the tankship. The ship may have onboard cargoes that are not necessarily handled by the terminal. It is imperative in emergency situations that terminal personnel have a copy of the vessel's shipping document and a set of cargo information cards. Proposed section 153.907(b) is being retained but has been moved to section 153.914 of the final rule.

Section 153.910 Cargo piping plan. As previously mentioned, this new section requires that a cargo piping plan be provided on board each tankship.

Section 153.933 Protective clothing required. This new section is added to the final rule to give direction to the master regarding the wearing of protective clothing for specific cargo handling operations.

Section 153.950 Person in charge of cargo transfer. One comment opposed the description in section 153.950 of the proposal, redesignated section 153.957, of the person in charge of cargo transfer and felt that the Coast Guard should require a tankerman at the point of cargo transfer in addition to the licensed officer. According to the comment, the complexities of cargo transfer are such that more than one person is necessary to continuously oversee the transfer procedures. The Coast Guard agrees that in most transfer operations more than one person would likely be necessary to do all the operations on the ship necessary to transfer the cargo. However, in drafting the rule, the Coast Guard has tried to place both the responsibility and authority to supervise a cargo transfer operation on the person in charge of cargo transfer. The Coast Guard has in no way limited the freedom of the person in charge to use other people on board the vessel and to assign them various tasks in the cargo transfer operations. However, it is unwise to fragment the responsibility for coordination of cargo transfer operations by assigning more than one person responsibility for the overall transfer, and the requirement as proposed has been retained. As mentioned in the preamble to the proposal of this part, section 153.957 refers to proposed regulations for tankermen (42 FR 21190, April 25, 1977). The Coast Guard expects these rules to be published in final form shortly. In the interim, § 153.957 has been changed to refer to 33 CFR 155.710 that describes requirements for the person in charge of an oil transfer operation.

Section 153.952 Warning signs. One comment suggested that 153.952 of the proposal, now redesignated 153.955, might be clearer if the sign containing the cargo warnings were illustrated rather than described in the text. The Coast Guard has retained the description of the sign in the text but has added an illustration of the sign to that section.

Section 153.1020 Unusually toxic cargoes. In the proposal, the requirement that a toxic cargo be isolated from other cargoes was described as a design requirement. However, unless a tankship dedicates certain cargo tanks only to toxic cargoes, it is impractical to guarantee this requirement in the design phase of the vessel. Therefore, the Coast Guard has modified the requirement slightly so that the cargo tank and piping system for an unusually toxic cargo must be designed so that they can be isolated. To make sure this is done when a toxic cargo is loaded, the Coast Guard has added to section 153.1020 a prohibition again any person loading or carrying toxic cargoes in containment systems which are not isolated from other cargo containment systems.

Section 153.1025 Motor fuel antiknock compounds. Two comments questioned the requirement in section 153.1025 that a person get specific approval from the Commandant (G–MHM) before entering a cargo tank endorsed for motor fuel antiknock compounds. The decontamination of a cargo tank which has carried motor fuel antiknock compounds is a difficult, dangerous, and tedious operation. For this reason the Coast

Guard does not want people haphazardly cleaning and entering motor fuel antiknock compound tanks. The manufacturers of motor fuel antiknock compounds usually have specially trained personnel to decontaminate materials that have been in contact with motor fuel antiknock compounds. To accommodate in part a suggestion that the manufacturers be allowed to enter tanks without Coast Guard approval, the Coast Guard has added a provision in section 153.1025 which would allow manufacturers to obtain prior approval of a decontamination procedure from the Coast Guard, and to obtain specific authorization to enter a tank in accordance with that procedure by merely calling Commandant (G-MHM).

Section 153.1052 Carriage of other cargoes in acid tanks. One comment questioned why the ship's personnel could not be given responsibility for deciding whether another cargo could be carried in a containment system endorsed for sulfuric, hydrochloric, or phosphoric acid. The Coast Guard's concern in this instance is that lining materials or other materials designed specifically to protect the tank against attack by one of these acids might be damaged if used with another cargo. Determining the compatibility of cargoes and tank lining materials can be quite complicated in many cases. The Coast Guard does not believe that the ship's licensed officers are likely to have the specialized training necessary to make such determinations. Therefore, the Coast Guard has left this requirement as proposed.

Section 153.1055 Nitropropane. One comment argued that the Coast Guard's proposal for nitropropane is too restrictive and ". . . not justified by any published technical data." The Coast Guard proposed that nitropropane be treated as follows:

a. It could not be carried in deck tanks.

b. It could not be carried in heated tanks, adjacent to heated cargoes, or adjacent to hold spaces containing tanks with heated cargoes.

c. If carried in a tank containing heating coils, the heating supply to the coils must be disconnected to prevent inadvertent heating.

The Coast Guard, in effect, is safeguarding against the possibility of this cargo becoming heated while carried on the tankship. The comment is correct in saying that the Coast Guard has no data to show that nitropropane is more hazardous when heated above ambient temperatures. In fact, the Coast Guard has data to show that nitropropane is not shock sensitive, even when heated, some of which the commenter furnished. However, nitromethane sometimes detonates violently when heated, and the chemical similarity of the two products raises the possibility that nitropropane might behave similarly. While some tests have shown that it will not, there is no assurance that those test procedures adequately simulate all the conditions under which the product might detonate. Similar testing difficulties were encountered with nitromethane. Until further testing has demonstrated that nitropropane will not behave similarly to nitromethane when heated under certain conditions, the relatively minor restrictions on the carriage of nitropropane will be retained.

Besides the changes to the original proposal described in this preamble, the final rule corrects many typographical errors.

This rule has been reviewed for economic effects under the Department of Transportation "Policies to Improve Analysis and Review of Regulations" (41 FR 16200). When doing so, the Coast Guard reviewed the design of both new and existing chemical ships under U.S. flag and those foreign ships operating in U.S. waters. As mentioned previously, the Coast Guard estimates that the rule will cost about $15,000,000 over the approximately one year period owners of existing vessels will have to meet the requirements. The rule will reduce the exposure of the crew and others near the vessel to cargo hazards. As a side effect, the rule may also reduce the likelihood of cargoes being spilled into waterways, though the incidence of spillage of these particular cargoes has been very low. Because the rule applies to all tankships carrying the listed cargoes in U.S. waters, and because the rule becomes fully effective on the same day as does the IMCO Chemical Code, no tankship will be put at an economic disadvantage in trying to meet the Chemical Code.

In consideration of the foregoing, Chapter I of Title 46 of the Code of Federal Regulations is amended by revoking Part 39; amending Parts 1, 2, 24, 30, 31, 32, 35, 40, 42, 56, 90, 91, 98, 105, 110, and 151 thereof; and adding a new Part 153 as follows:

PART 1—ORGANIZATION, GENERAL COURSE AND METHODS GOVERNING MARINE SAFETY FUNCTIONS

1. In § 1.01(b)(1), by inserting the words "Chief, Cargo and Hazardous Materials Division," immediately after the words "Chief, Merchant Vessel Inspection Division" and by adding § 1.01(b)(1)(iv) to read as follows:

§ 1.01 Organization.

* * * * * * *

(b) * * *

(1) * * *

(iv) The Chief, Cargo and Hazardous Materials Division at Coast Guard Headquarters, under the direction of the Chief, Office of Merchant Marine Safety, administers the program for the development of safe containment systems for certain bulk dangerous cargoes, administers the Letter of Compliance program for foreign vessels carrying cargoes of unusual hazard and evaluates the hazards involved in the shipment of dangerous cargoes.

§ 1.20 [Amended]

2. By striking out in the third sentence of § 1.20(b) the word "three" and inserting the word "four" in place thereof.

PART 2—VESSEL INSPECTIONS

§ 2.01-1 [Amended]

3. By adding in § 2.01-1(c) the words "O (Certain Bulk Dangerous Cargoes)," immediately after the words, "J (Electrical Engineering)".

4. By revising footnote number 10 to Table 2.01-7(a) to read as follows: "10 Bulk dangerous cargoes are cargoes specified in table 151.01-10(b), in table I of Part 153, and in table 4 of Part 154 of this chapter" and in table 2.01-7(a) by revising column 8 and adding footnote 12 to read as set forth below, and by adding a new paragraph (b)(6) as follows:

§ 2.01-7 Classes of vessels (including motorboats) examined or inspected and certificated.

* * * * * * *

(b) * * *

(6) For vessels carrying certain bulk dangerous cargoes see subchapter O of this chapter.

Col. 1	Col. 2	* * *	Col. 8
Steam	Vessels not over 65 ft in length		All vessels carrying in bulk the cargoes listed in table I of pt. 153 and table 4 of pt. 154.[12]
	Vessels over 65 ft in length		Do.
Motor	Vessels not over 15 gross tons		Do.
	Vessels over 15 gross tons except seagoing motor vessels of 300 gross tons and over.		
	Seagoing motor vessels of 300 gross tons and over		Do.
Sail	Vessels not over 700 gross tons		Do.
	Vessels over 700 gross tons		Do.
Non-self-propelled	Vessels less than 100 gross tons		All tank barges carrying in bulk the cargoes listed in table 151.05 of this chapter.[11,12]
	Vessels 100 gross tons or over		Do.

* * * * * * *

[12] Except those cases excluded under 46 U.S.C. 170 or 391a.

* * * * * * *

7. By revising § 2.01-13(c) to read as follows:

§ 2.01-13 Inspection requirements—foreign vessels.

* * * * *

(c) For details concerning application of regulations to foreign vessels, see Part 30 (Tank Vessels), Part 70 (Passenger Vessels), Part 90 (Cargo and Miscellaneous Vessels), § 146.02-2 (Danger-

ous Cargoes), Part 148 (Bulk Solid Hazardous Materials), Parts 153 and 154 (Certain Bulk Dangerous Cargoes), and Part 175 (Small Passenger Vessels) of this chapter.

8. By adding § 2.01–15(a)(10) to read as follows:

§ 2.01–15 Vessel repairs.

* * * * *

(a) * * *

(10) For vessels carrying compressed gases regulated by Subchapter O (Certain Bulk Dangerous Cargoes), see § 151.-50–30(c) of this chapter.

9. By revising the last sentence of § 2.01–25(b)(1) to read as follows:

§ 2.01–25 International Convention for Safety of Life at Sea, 1960.

* * * * *

(b) * * *

(1) * * * Further details are set forth in Subchapter D (Tank Vessels), Subchapter H (Passenger Vessels), Subchapter I (Cargo and Miscellaneous Vessels), Subchapter O (Certain Bulk Dangerous Cargoes), and Subchapter T (Small Passenger Vessels) of this chapter.

* * * * *

10. By adding § 2.90–1(h) to read as follows:

§ 2.90–1 General requirements.

* * * * *

(h) The requirements for vessels carrying certain bulk dangerous cargoes are in Parts 148, 151, 153, and 154 of this chapter.

PART 24—GENERAL PROVISIONS

§ 24.05–1 [Amended]

In § 24.05–(a) the table is amended by revising footnote number 10 to read as follows: "10 Bulk dangerous cargoes are cargoes specified in table 151.01–10(b), in table I of Part 153, and in table 4 of Part 154 of this chapter" and by revising column 8 and adding footnote 12 as follows:

Col. 1	Col. 2	* * *	Col. 8
Steam	Vessels not over 65 ft in length		All vessels carrying in bulk the cargoes listed in table I of pt. 153 and table 4 of pt. 154.[12]
	Vessels over 65 ft in length		Do.
Motor	Vessels not over 15 gross tons		Do.
	Vessels over 15 gross tons except seagoing motor vessels of 300 gross tons and over.		Do.
	Seagoing motor vessels of 300 gross tons and over		Do.
Sail	Vessels not over 700 gross tons		Do.
	Vessels over 700 gross tons		Do.
Non-self-propelled	Vessels less than 100 gross tons		All tank barges carrying in bulk the cargoes listed in table 151.05 of this chapter.[11, 12]
	Vessels 100 gross tons or over		Do.

* * * * * * *

[11] Except those cases excluded under 46 U.S.C. 170 or 391a.

* * * * * * *

PART 30—GENERAL PROVISIONS

§ 30.01–5 [Amended]

By revoking §§ 30.01–5(b) (8) and (9), and by amending the table in paragraph (d) by revising footnote number 10 to read as follows: "10 Bulk dangerous cargoes are cargoes specified in table 151.01–10(b), in table I of Part 153, and in table 4 of Part 154 of this chapter" and by revising column 8 and adding footnote 12 as follows:

Col. 1	Col. 2	* * *	Col. 8
Steam	Vessels not over 65 ft in length		All vessels carrying in bulk the cargoes listed in table I of pt. 153 and table 4 of pt. 154.[12]
	Vessels over 65 ft in length		Do.
Motor	Vessels not over 15 gross tons		Do.
	Vessels over 15 gross tons except seagoing motor vessels of 300 gross tons and over.		Do.
	Seagoing motor vessels of 300 gross tons and over		Do.
Sail	Vessels not over 700 gross tons		Do.
	Vessels over 700 gross tons		Do.
Non-self-propelled	Vessels less than 100 gross tons		All tank barges carrying in bulk the cargoes listed in table 151.05 of this chapter.[11, 12]
	Vessels 100 gross tons or over		Do.

* * * * * * *

[11] Except those cases excluded under 46 U.S.C. 170 or 391a.

* * * * * * *

§ 30.10–15 [Amended]

In § 30.10–15, by striking out the second sentence.

§ 30.10–22 [Amended]

In § 30.10–22, by striking out the second sentence.

By revising § 30.25–1 to read as follows:

§ 30.25–1 Cargoes carried in vessels certificated under the rules of this subchapter.

The cargoes listed in table 30.25–1 and mixtures composed solely of these cargoes have been found to be flammable or combustible and may be transported in bulk only in vessels certificated under the rules of this subchapter.[1]

TABLE 30.25–1

Acetone
Amyl Acetate (iso-, n-)
Amyl Alcohol (n-)
Amyl Tallate
Asphalt
Asphalt Blending Stocks:
  Roofers Flux
  Straight Run Residue
Butane
Butyl Acetate (iso-, n-, sec-)
Butyl Alcohol (iso-, n-, sec-, tert-)
Butyl Benzyl Phthalate
Butylene
1,3-Butylene Glycol
Cumene
Cycloaliphatic Resins
Cyclohexane
Cyclohexanol
Cymene (para-)
Decyl Alcohol (iso-, n-)
Decyl Benzene (-n)
Decaldehyde (iso-, n-)
Decene
Diacetone Alcohol
Dibutyl Phthalate (ortho-)
Diethylbenzene
Diethylene Glycol
Diethylene Glycol Monobutyl Ether (Methyl Carbitol)
Diethylene Glycol Monobutyl Ether Acetate
Diethylene Glycol Monoethyl Ether
Diethylene Glycol Monomethyl Ether
Diglycidyl Ether of Bisphenol A
Diheptyl Phthalate
Diisobutylene
Diisobutyl Carbinol
Diisobutyl Ketone
Diisodecyl Phthalate
Dinonyl Phthalate
Dioctyl Phthalate
Diphenyl-diphenyl oxide
Dipropylene Glycol
Distillates:
  Straight Run
  Flashed Feed Stocks
Diundecyl Phthalate
Dodecanol
Dodecylbenzene (commercial)
Epoxylated Linear Alcohols, C11–C15
Ethane
Ethoxylated Alcohols, C12–C15
Ethoxy Triglycol (crude)
Ethyl Acetate
Ethyl Alcohol

[1] See Parts 151, 153, and 154 of this chapter for additional rules governing the bulk carriage of dangerous cargoes.

Ethyl Benzene
Ethyl Butanol
Ethylene
Ethylene Glycol
Ethylene Glycol Monobutyl Ether
Ethylene Glycol Monobutyl Ether Acetate
Ethylene Glycol Monoethyl Ether
Ethylene Glycol Monoethyl Ether Acetate
Ethylhexaldehyde
2-Ethyl Hexanol
Ethyl Hexyl Tallate
Furfuryl Alcohol
Gas Oil:
  Cracked
Gasoline Blending Stocks:
  Alkylates
  Reformates
Gasolines:
  Casinghead (natural)
  Automotive (containing not over 4.23 grams lead per gallon)
  Aviation (containing not over 4.86 grams lead per gallon)
  Polymer
  Straight Run
Glycerine
Glycol Diacetate
Glyoxal (40%)
Heptane
Heptanol
Hexane (iso-, n-)
Hexanol
Hexene
Hexylene Glycol
Isophorone
Jet Fuels:
  JP-1 (Kerosene)
  JP-3
  JP-4
  JP-5 (Kerosene, Heavy)
Kerosene
Latex, Liquid Synthetic
Methane
Methyl Acetate
Methyl Alcohol
Methyl Amyl Acetate
Methyl Amyl Alcohol
Methyl Ethyl Ketone
Methyl Formal (Dimethyl Formal)
Methyl Isobutyl Ketone
Methyl Isobutyl Carbinol
Mineral Spirits
Naphtha:
  Solvent
  Stoddard Solvent
  Varnish Makers' and Painters' (75%)
Nonane
Nonene
Nonyl Alcohol
Nonyl Phenol
Nonyl Phenol (ethoxylated)
Octene
Octyl Alcohol (iso-, n-)
Octyl Aldehyde (iso-)
Octyl Epoxytallate
Oils:
  Absorption
  Aromatic
  Clarified
  Coal Oil
  Coal Tar
  Croton
  Crude Oil
  Diesel Oil
  Fuel Oils:
    No. 1 (Kerosene)
    No. 1-D
    No. 2
    No. 2-D
    No. 4
    No. 5
    No. 6
  Heartcut Distillate
  Lubricating
  Mineral Seal
  Mineral
  Motor
  Neatsfoot
  Linseed
  Penetrating
  Range
  Residual
  Resin
  Resinous Petroleum
  Road
  Rosin
  Sperm
  Spindle
  Spray
  Tall
  Tanner's
  Transformer
  Turbine
Edible Oils, including:
  Castor
  Coconut
  Cotton Seed
  Fish
  Lard
  Olive
  Palm
  Peanut
  Safflower
  Soya Bean
  Tucum
  Vegetable
Pentadecanol
Pentane (iso-, n-)
1-Pentene
Petrolatum
Petroleum Naphtha
Phosphorized Bicyclic Terpine
Phthalate Plasticizers
Polybutene
Polyethylene Glycols
Polymerized Esters
Polypropylene
Polypropylene Glycol Methyl Ether
Polypropylene Glycols
Propane
Propyl Acetate (iso-, n-)
Propyl Alcohol (iso-, n-)
Propylene
Propylene Butylene Polymer
Propyl Ether (iso-)
Propylene Glycol
Propylene Tetramer
Soybean Oil (Epoxidized)
Sulfolane
Tallow
Tetradecanol
Tetradecene
Tetradecyl Benzene
Tetraethylene Glycol
Tetrahydronaphthalene
Toluene
Tridecanol
Tridecene
Tridecyl Benzene
Triethyl Benzene
Triethylene Glycol
Triethylene Glycol Diethyl Butyrate
Tripropylene Glycol
Turpentine
Undecanol
Undecene
Undecylbenzene
Waxes:
  Carnauba
  Paraffin
Xylene (meta-, para-, ortho-)
Zinc Dialkyldithiophosphate

§ 30.25–5 [Revoked]

By revoking § 30.25–5 and table 30.25–5.

PART 31—INSPECTION AND CERTIFICATION

§ 31.05–1 [Amended]

By striking out the last sentence in § 31.05–1(b).

PART 32—SPECIAL EQUIPMENT, MACHINERY, AND HULL REQUIREMENTS

By revising § 32.55–20(b)(1) to read as follows:

§ 32.55–20 Venting of cargo tanks of tankships constructed on or after July 1, 1951—T/ALL.

* * * * *

(b) * * *

(1) Cargo tanks in which Grade A liquids are to be transported must be fitted with a venting system consisting of a branch vent line from each cargo tank connected to a vent header which must extend to a height above the weather-deck equal to at least 13.1 feet and must terminate at a comparable distance from any living or working space, ventilator inlet, or source of ignition. When special conditions will prevent the vent line or header outlets being permanently installed at a height above the deck of 13.1 feet, an adjustable system must be provided which, when extended vertically, is capable of reaching a height of 13.1 feet.

* * * * *

PART 35—OPERATIONS

§ 35.30–1 [Amended]

By striking out § 35.30–1(b)(2)..

PART 39—FLAMMABLE OR COMBUSTIBLE LIQUIDS HAVING LETHAL CHARACTERISTICS [REVOKED]

By revoking Part 39.

PART 40—SPECIAL CONSTRUCTION, ARRANGEMENT, AND OTHER PROVISIONS FOR CARRYING CERTAIN FLAMMABLE OR COMBUSTIBLE DANGEROUS CARGOES IN BULK

Subpart 40.10 [Revoked]

By revoking Subpart 40.10.

PART 42—DOMESTIC AND FOREIGN VOYAGES BY SEA

§ 42.20–5 [Amended]

In § 42.20–5(a–1), by adding the words "46 CFR 153.20, 153.21, 153.22, or 154.210" immediately after the words "33 CFR 157.21".

PART 56—PIPING SYSTEMS AND APPURTENANCES

§ 56.04–2 [Amended]

By revising footnote 2 of table 56.04–2 in § 56.04–2 to read as follows:

[2] For definitions, see 46 CFR Parts 30, 151, and 154. Note that the category "B and C" poisons is not used in the rules applying to self-propelled vessels (46 CFR Part 153).

PART 70—GENERAL PROVISIONS

In § 70.05—1(a) the table is amended by revising footnote number 10 to read as follows: "10 Bulk dangerous cargoes are cargoes specified in table 151.01–10 (b), in table I of Part 153, and in table 4 of Part 154 of this chapter" and by revising column 8 and adding footnote 12 as follows:

Col. 1	Col. 2	• • •	Col. 8
Steam	Vessels not over 65 ft in length		All vessels carrying in bulk the cargoes listed in table I of pt. 153 and table 4 of pt. 154 [12]
	Vessels over 65 ft in length		Do.
Motor	Vessels not over 15 gross tons		Do.
	Vessels over 15 gross tons except seagoing motor vessels of 300 gross tons and over.		Do.
	Seagoing motor vessels of 300 gross tons and over		Do.
Sail	Vessels not over 700 gross tons		Do.
	Vessels over 700 gross tons		Do.
Non-self propelled	Vessels less than 100 gross tons		All tank barges carrying in bulk the cargoes listed in table 151.05 of this chapter.[11, 12]
	Vessels 100 gross tons or over		Do.

[12] Except those cases excluded under 46 U.S.C. 170 or 391a.

PART 90—GENERAL PROVISIONS

In § 90.05–1 (o) the table is amended by revising footnote number 10 to read as follows: "10 Bulk dangerous cargoes are cargoes specified in table 151.01–10 (b), in table I of Part 153, and in table 4 of Part 154 of this chapter" and by revising column 8 and adding footnote 12 as follows:

Col. 1	Col. 2	• • •	Col. 8
Steam	Vessels not over 65 ft in length		All vessels carrying in bulk the cargoes listed in table I of pt. 153 and table 4 of pt. 154.[12]
	Vessels over 65 ft in length		Do.
Motor	Vessels not over 15 gross tons		Do.
	Vessels over 15 gross tons except seagoing motor vessels of 300 gross tons and over.		Do.
	Seagoing motor vessels of 300 gross tons and over		Do.
Sail	Vessels not over 700 gross tons		Do.
	Vessels over 700 gross tons		Do.
Non-self propelled	Vessels less than 100 gross tons		All tank barges carrying in bulk the cargoes listed in table 151.05 of this chapter.[11, 12]
	Vessels 100 gross tons or over		Do.

[12] Except those cases excluded under 46 U.S.C. 170 or 391a.

PART 91—INSPECTION AND CERTIFICATION

§ 91.55–15 [Amended]

In § 91.55–15(a)(2), by striking out the words "1300 'E' Street NW., Washington, D.C. 20590" and substituting the words "Washington, D.C. 20590" in place thereof.

PART 98—SPECIAL CONSTRUCTION, ARRANGEMENT, AND PROVISIONS FOR CERTAIN DANGEROUS CARGOES IN BULK

§ 98.01–5 [Amended]

By revoking § 98.01–5(d).

By striking out the first sentence of § 98.01–5(e).

Subpart 98.05 [Revoked]

By revoking Subpart 98.05.

Subpart 98.10 [Revoked]

By revoking Subpart 98.10.

Subpart 98.15 [Revoked]

By revoking Subpart 98.15.

Subpart 98.18 [Revoked]

By revoking Subpart 98.18.

PART 105—COMMERCIAL FISHING VESSELS DISPENSING PETROLEUM PRODUCTS

§ 105.10–10 [Amended]

In § 105.10–10(a), by striking out the second sentence.

§ 105.10–15 [Amended]

In § 105.10–15(a), by striking out the second sentence.

PART 110—GENERAL PROVISIONS

In § 110.05–1(a) the table is amended by revising footnote number 10 to read as follows: "10 Bulk dangerous cargoes are cargoes specified in table 151.01–10 (b), in table I of Part 153, and in table 4 of Part 154 of this chapter" and by revising column 8 and adding footnote 12 as follows:

Col. 1	Col. 2	• • •	Col. 8
Steam	Vessels not over 65 ft in length		All vessels carrying in bulk the cargoes listed in table I of pt. 153 and table 4 of pt. 154.[1]
Motor	Vessels over 65 ft in length		Do.
	Vessels not over 15 gross tons		Do.
	Vessels over 15 gross tons except seagoing motor vessels of 300 gross tons and over.		Do.
	Seagoing motor vessels of 300 gross tons and over		Do.
Sail	Vessels not over 700 gross tons		Do.
	Vessels over 700 gross tons		Do.
Non-self-propelled	Vessels less than 100 gross tons		All tank barges carrying in bulk the cargoes listed in table 151.05 of this chapter.[1], [2]
	Vessels 100 gross tons or over		Do.

• • • • • • • • •

[1] Except those cases excluded under 46 U.S.C. 170 or 391a.

• • • • • • • • •

PART 151—UNMANNED BARGES CARRYING CERTAIN BULK DANGEROUS CARGOES

By amending table 151.01–10(d) in § 151.01–10(d) as follows:

TABLE 151.01–10(d) • • •

Acetone
Amyl Acetate (iso-, n-)
Amyl Alcohol (n-)
Amyl Tallate
Asphalt
Asphalt Blending Stocks:
  Roofers Flux
  Straight Run Residue
Butane
Butyl Acetate (iso-, n-, sec-)
Butyl Alcohol (iso-, n-, sec-, tert-)
Butyl Benzyl Phthalate
Butylene
1,3-Butylene Glycol
Cumene
Cycloaliphatic Resins
Cyclohexane
Cyclohexanol
Cymene (para-)
Decyl Alcohol (iso-, n-)
Decyl Benzene (n-)
Decaldehyde (iso-, n-)
Decene
Diacetone Alcohol
Dibutyl Phthalate (ortho-)
Diethylbenzene
Diethylene Glycol
Diethylene Glycol Monobutyl Ether (Methyl Carbitol)
Diethylene Glycol Monobutyl Ether Acetate
Diethylene Glycol Monoethyl Ether
Diethylene Glycol Monomethyl Ether
Diglycidyl Ether of Bisphenol A
Diheptyl Phthalate
Diisobutylene
Diisobutyl Carbinol
Diisobutyl Ketone
Diisodecyl Phthalate
Dinonyl Phthalate
Dioctyl Phthalate
Diphenyl-diphenyl oxide
Dipropylene Glycol
Distillates:
  Straight Run
  Flashed Feed Stocks
Diundecyl Phthalate
Dodecanol
Dodecylbenzene (commercial)
Epoxylated Linear Alcohols, C11–C15
Ethane
Ethoxylated Alcohols, C12–C15
Ethoxy Triglycol (crude)
Ethyl Acetate
Ethyl Alcohol
Ethyl Benzene
Ethyl Butanol
Ethylene
Ethylene Glycol
Ethylene Glycol Monobutyl Ether
Ethylene Glycol Monobutyl Ether Acetate
Ethylene Glycol Monoethyl Ether
Ethylene Glycol Monoethyl Ether Acetate
Ethylhexaldehyde
2-Ethyl Hexanol
Ethyl Hexyl Tallate
Furfuryl Alcohol
Gas Oil:
  Cracked
Gasoline Blending Stocks:
  Alkylates
  Reformates
Gasolines:
  Casinghead (natural)
  Automotive (containing not over 4.23 grams lead per gallon)
  Aviation (containing not over 4.86 grams lead per gallon)
  Polymer
  Straight Run
Glycerine
Glycol Diacetate
Glyoxal (40 percent)
Heptane
Heptanol
Hexane (iso-, n-)
Hexanol
Hexene
Hexylene Glycol
Isophorone
Jet Fuels:
  JP–1 (Kerosene)
  JP–3
  JP–4
  JP–5 (Kerosene, Heavy)
Kerosene
Latex, Liquid Synthetic
Methane
Methyl Acetate
Methyl Alcohol
Methyl Amyl Acetate
Methyl Amyl Alcohol
Methyl Ethyl Ketone
Methyl Formal (Dimethyl Formal)
Methyl Isobutyl Ketone
Methyl Isobutyl Carbinol
Mineral Spirits
Naphtha:
  Solvent
  Stoddard Solvent
  Varnish Makers' and Painters' (75 percent)
Nonane
Nonene
Nonyl Alcohol
Nonyl Phenol
Nonyl Phenol (ethoxylated)
Octene
Octyl Alcohol (iso-, n-)
Octyl Aldehyde (iso-)
Octyl Epoxytallate
Oils:
  Absorption
  Aromatic
  Clarified
  Coal Oil
  Coal Tar
  Croton
  Crude Oil
  Diesel Oil
Fuel Oils:
  No. 1 (Kerosene)
  No. 1–D
  No. 2
  No. 2–D
  No. 4
  No. 5
  No. 6
Heartcut Distillate Lubricating:
  Mineral Seal
  Mineral
  Motor
  Neatsfoot
  Linseed
  Penetrating
  Range
  Residual
  Resin
  Resinous Petroleum
  Road
  Rosin
  Sperm
  Spindle
  Spray
  Tall
  Tanner's
  Transformer
  Turbine
Edible Oils, Including:
  Castor
  Coconut
  Cotton Seed
  Fish
  Lard
  Olive
  Palm
  Peanut
  Safflower
  Soya Bean
  Tucum
  Vegetable
Pentadecanol
Pentane (iso-, n-)
1-Pentene
Petrolatum
Petroleum Naphtha
Phosphorized Bicyclic Terpine
Phthalate Plasticizers
Polybutene
Polyethylene Glycols
Polymerized Esters
Polypropylene
Polypropylene Glycol Methyl Ether
Polypropylene Glycols
Propane
Propyl Acetate (iso-, n-)
Propyl Alcohol (iso-, n-)
Propylene
Propylene Butylene Polymer
Propyl Ether (iso-)
Propylene Glycol
Propylene Tetramer
Soybean Oil (Epoxidized)
Sulfolane
Tallow
Tetradecanol
Tetradecene
Tetradecyl Benzene
Tetraethylene Glycol
Tetrahydronaphthalene
Toluene
Tridecanol
Tridecene
Tridecyl Benzene
Triethyl Benzene
Triethylene Glycol
Triethylene Glycol Diethyl Butyrate
Tripropylene Glycol
Turpentine
Undecanol
Undecene
Undecylbenzene

Waxes:
Carnauba
Paraffin
Xylene (meta-, para-, ortho-)
Zinc Dialkyldithiophosphate

In § 151.01–10(f) the table is amended by revising footnote number 10 to read as follows: "10 Bulk dangerous cargoes are cargoes specified in table 151.01–10 (b), in table I of Part 153, and in table 4 of Part 154 of this chapter" and by revising column 8 and adding footnote 12 as follows:

Col. 1	Col. 2	• • •	Col. 8
Steam	Vessels not over 65 ft in length		All vessels carrying in bulk the cargoes listed in table I of pt. 153 and table 4 of pt. 154.[12]
Motor	Vessels over 65 ft in length		Do.
	Vessels not over 15 gross tons		Do.
	Vessels over 15 gross tons except seagoing motor vessels of 300 gross tons and over.		Do.
	Seagoing motor vessels of 300 gross tons and over		Do.
Sail	Vessels not over 700 gross tons		Do.
	Vessels over 700 gross tons		Do.
Non-self propelled	Vessels less than 100 gross tons		All tank barges carrying in bulk the cargoes listed in table 151.05 of this chapter.[11, 12]
	Vessels 100 gross tons or over		Do.

[12] Except those cases excluded under 46 U.S.C. 170 or 391a.

PART 175—GENERAL PROVISIONS

In § 175.05–1(a) the table is amended by revising footnote number 10 to read as follows: "10 Bulk dangerous cargoes are cargoes specified in table 151.01–10 (b), in table I of Part 153, and in table 4 of Part 154 of this chapter" and by revising column 8 and adding footnote 12 as follows:

Col. 1	Col. 2	• • •	Col. 8
Steam	Vessels not over 65 ft in length		All vessels carrying in bulk the cargoes listed in table I of pt. 153 and table 4 of pt. 154.[12]
Motor	Vessels over 65 ft in length		Do.
	Vessels not over 15 gross tons		Do.
	Vessels over 15 gross tons except seagoing motor vessels of 300 gross tons and over.		Do.
	Seagoing motor vessels of 300 gross tons and over		Do.
Sail	Vessels not over 700 gross tons		Do.
	Vessels over 700 gross tons		Do.
Non-self-propelled	Vessels less than 100 gross tons		All tank barges carrying in bulk the cargoes listed in table 151.05 of this chapter.[11, 12]
	Vessels 100 gross tons or over		Do.

[12] Except those cases excluded under 46 U.S.C. 170 or 391a.

PART 188—GENERAL PROVISIONS

In § 188.05–1(a) the table is amended by revising footnote number 10 to read as follows: "10 Bulk dangerous cargoes are cargoes specified in table 151.01–10 (b), in table I of Part 153, and in table 4 of Part 154 of this chapter" and by revising column 8 and adding footnote 12 as follows:

Col. 1	Col. 2	• • •	Col. 8
Steam	Vessels not over 65 ft in length		All vessels carrying in bulk the cargoes listed in table I of pt. 153 and table 4 of pt. 154.[12]
Motor	Vessels over 65 ft in length		Do.
	Vessels not over 15 gross tons		Do.
	Vessels over 15 gross tons except seagoing motor vessels of 300 gross tons and over.		Do.
	Seagoing motor vessels of 300 gross tons and over		Do.
Sail	Vessels not over 700 gross tons		Do.
	Vessels over 700 gross tons		Do.
Non-self-propelled	Vessels less than 100 gross tons		All tank barges carrying in bulk the cargoes listed in table 151.05 of this chapter.[11, 12]
	Vessels 100 gross tons or over		Do.

[12] Except those cases excluded under 46 U.S.C. 170 or 391a.

PART 153—SAFETY RULES FOR SELF-PROPELLED VESSELS CARRYING HAZARDOUS LIQUIDS

By amending Subchapter O by adding a new Part 153 to read as follows:

Subpart A—General

Sec.

153.1 Applicability.
153.2 Definitions.
153.5 Carriage of hazardous or flammable cargo in bulk.
153.7 Existing tankships.
153.8 U.S. flag vessel endorsement application.
153.9 Applications for Letters of Compliance.
153.10 Equivalent standards.
153.12 IMCO Certificates for U.S. flag vessels.
Table I Table of minimum requirements.

Subpart B—Requirements

General

153.15 Requirements for U.S. flag vessel permits.
153.16 Requirements for foreign flag vessel permits.

Hull Type Calculations

153.20 Type I hull calculations.
153.21 Type II hull calculations.
153.22 Type III hull calculations.
153.30 Permeability of spaces.
153.31 Free surface effect.
153.32 Damage.
153.34 Survival.
153.35 Loadline requirements.

General Vessel Requirements

153.200 Portlights, wheelhouse windows, and wheelhouse doors.
153.202 Location of doors and airports on deckhouses and superstructures.
153.208 Ballast equipment.
153.209 Bilge pumping systems.
153.214 Personnel emergency and safety equipment
153.215 Safety equipment lockers.
153.216 Shower and eyewash fountains.
153.217 Access to void spaces.

Cargo Containment Systems

153.230 Type I system.
153.231 Type II system.
153.232 Type III system.
153.233 Separation of tanks from machinery, service, and other spaces.
153.234 Fore and aft location.
153.235 Exceptions to cargo piping location restrictions.
153.236 Prohibited materials.
153.238 Required materials.
153.239 Cast iron prohibited.
153.240 Insulation.

Cargo Tanks

153.250 Double-bottom and deep tanks as cargo tanks.
153.251 Independent cargo tanks.
153.252 Special requirement for an independent cargo tank.
153.253 Quick closing shutoff valves with spill valves.
153.254 Cargo tank access.
153.256 Trunks, domes, and openings of cargo tanks.
153.266 Tank linings.

Piping Systems and Cargo Handling Equipment

153.280 Piping system design.
153.281 Piping to required independent tanks.

Sec
153.282 Cargo filling lines.
153.283 Valving for cargo piping.
153.284 Characteristics of required quick closing valves.
153.285 Valving for cargo pump manifolds.
153.294 Marking of piping systems.
153.296 Emergency shutdown stations.
153.297 Emergency actuators at the point of cargo control.

CARGO HANDLING SPACE VENTILATION

153.310 Ventilation system type.
153.312 Ventilation system standards.
153.314 Ventilation of spaces not usually occupied.
153.316 Special cargo pumproom ventilation rate.

CARGO PUMPROOMS

153.330 Access.
153.332 Hoisting arrangement.
153.333 Cargo pump discharge pressure gauge.
153.334 Bilge pumping systems.
153.336 Special cargo pump or pumproom location requirements.

CARGO VENTING SYSTEMS

153.350 Location of B/3 vent discharges.
153.351 Location of 4m vent discharges.
153.352 B/3 and 4 m venting system outlets.
153.353 High velocity vents.
153.354 Venting system inlet.
153.355 PV venting systems.
153.358 Venting system flow capacity.
153.360 Venting system restriction.
153.361 Arrangements for removal of valves from venting systems having multiple relief valves.
153.362 Venting system drain.
153.364 Venting system supports.
153.366 Spill valves.
153.368 Pressure vacuum valves.
153.370 Minimum relief valve setting for ambient temperature cargo tank.
153.371 Minimum relief valve setting for refrigerated cargo tank.
153.372 Gauges and vapor return for cargo vapor pressures exceeding 100 kPa (approx. 1 atmosphere).

CARGO GAUGING SYSTEMS

153.400 General requirements for gauges.
153.404 Standards for containment systems having required closed gauges.
153.406 Standards for containment systems having required restricted gauges.
153.407 Special requirements for sounding tube gauges.
153.408 Tank overfill controls.
153.409 High level alarms.

CARGO TEMPERATURE CONTROL SYSTEMS

153.430 Heat transfer systems; general.
153.432 Cooling systems.
153.434 Heat transfer coils within a tank.
153.436 Heat transfer fluid.
153.438 Cargo pressure or temperature alarms required.
153.440 Cargo temperature sensors required.

SPECIAL REQUIREMENTS FOR FLAMMABLE OR COMBUSTIBLE CARGOES

153.460 Fire protection systems.
153.461 Electrical bonding of independent tanks.
153.462 Static discharges from inert gas systems.
153.463 Vent system discharges.
153.464 Fusible elements.
153.465 Flammable vapor detector.
153.466 Electrical equipment.
153.467 Ventilation systems for flammable cargoes.

SPECIAL REQUIREMENTS

153.500 Inert gas systems.
153.501 Requirement for dry inert gas.
153.515 Special requirements for extremely flammable cargoes.
153.520 Special requirements for carbon disulfide.
153.525 Special requirements for unusually toxic cargoes.
153.526 Toxic vapor detectors.
153.527 Toxic vapor protection.
153.530 Special requirements for alkylene oxides.
153.545 Special requirements for liquid sulfur.
153.554 Special requirements for acids.
153.555 Special requirements for inorganic acids.
153.556 Special requirements for sulfuric acid and oleum.
153.557 Special requirements for hydrochloric acid.
153.558 Special requirements for phosphoric acid.
153.559 Special requirements for nitric acid (less than 70%).
153.600 Special requirements for nitropropane.

TESTING AND INSPECTION

153.806 Stability test and information.
153.808 Examination required for a Letter of Compliance.
153.809 Procedures for having the Coast Guard examine a vessel for a Letter of Compliance.
153.810 Fourteen day notice required for a Letter of Compliance examination.
153.811 Carrying cargo into U.S. waters on the voyage for a Letter of Compliance examination.
153.812 Inspection for Certificate of Inspection.

Subpart C—Operations

DOCUMENTS AND CARGO INFORMATION

153.900 Certificates, letters, endorsements required.
153.901 Certificates or Letters required to be on bridge.
153.902 Expiration of Letters of Compliance
153.904 Limitations in the endorsement.
153.905 Regulations required to be onboard.
153.907 Cargo information cards.
153.908 Shipping document.
153.909 Cargo location plan.
153.910 Cargo piping plan.
153.912 Certificate of inhibition or stabilization.
153.914 Documents at the transfer terminal.

GENERAL CARGO OPERATIONAL REQUIREMENTS

153.920 Cargo quantity limitations.
153.921 Explosives.
153.923 Inerting systems.

GENERAL VESSEL SAFETY

153.930 Cargo antidotes.
153.931 Obstruction of pumproom ladderways.
153.932 Goggles and protective clothing.
153.933 Protective clothing required.
153.934 Entry into spaces containing cargo vapor.
153.935 Opening of tanks and cargo sampling.
153.936 Illness, alcohol, drugs.

MARKING OF CARGO TRANSFER HOSE

153.940 Standards for marking of cargo hose.

CARGO TRANSFER PROCEDURES

153.953 Signals during cargo transfer.
153.955 Warning signs during cargo transfer.
153.957 Person in charge of cargo transfer.
153.959 Approval to begin transfer operations required.
153.963 Incompatible cargo.
153.964 Discharge by gas pressurization.
153.966 Discharge by liquid displacement.
153.968 Cargo transfer conference.
153.970 Cargo transfer piping.
153.972 Connecting a cargo hose.
153.975 Preparation for cargo transfer.
153.976 Transfer of packaged cargo or ship's stores.
153.977 Supervision of cargo transfer.
153.979 Gauging with a sounding tube.
153.981 Leaving room in tank for cargo expansion.
153.983 Termination procedures.

SPECIAL CARGO PROCEDURES

153.1000 Special operating requirements for cargoes reactive with water.
153.1010 Alkylene oxides.
153.1011 Use of alkylene oxide containment systems and hoses with other products.
153.1020 Unusually toxic cargoes.
153.1025 Motor fuel antiknock compounds.
153.1035 Stabilization of acetone cyanohydrin.
153.1040 Carbon disulfide.
153.1045 Inorganic acids.
153.1046 Sulfuric acid.
153.1052 Carriage of other cargoes in acid tanks.
153.1055 Nitropropane.

MAINTENANCE

153.1500 Venting system rupture disks.
153.1502 Fixed ballast relocation.
153.1504 Inspection of personnel emergency and safety equipment.

Appendix I—

List of cargoes not regulated under Part 153 or Subchapter D

Appendix II—

[Reserved]

Appendix III—

Metric units used in Part 153

AUTHORITY: 46 U.S.C. 170 for all dangerous cargoes except flammable and combustible liquids, for which the authority for the regulations is 46 U.S.C. 391a.

Subpart A—General

§ 153.1 Applicability.

This part prescribes rules that apply to tankships[1] that have on board the cargoes described in § 153.5 for the purpose of implementing the requirements in the law governing vessels having on board flammable or combustible liquid cargo in bulk (46 U.S.C. 391a) and the law governing the carriage of explosives and

[1] Because the definition of "tankship" includes the condition that at least one of the cargo tanks have some quantity of cargo liquid or vapor inside, this part does not apply to a vessel whose cargo tanks are clean and gas free.

other dangerous articles in bulk (46 U.S.C. 170).

§ 153.2 Definitions.

As used in this part:

"Accommodation spaces" means halls, dining rooms, lounges, lavatories, cabins, staterooms, offices, hospitals, cinemas, game and hobby rooms, pantries containing no cooking appliances, and similar permanently enclosed spaces.

"B" means the breadth of the vessel in meters and is defined in § 42.13–15(d) of this chapter.

"Cargo containment system" means a cargo tank, its cargo piping system, its venting system, and its gauging system.

"Cargo handling space" means an enclosed space that must be entered during a routine loading, carriage, or discharge of cargo and that contains an element of the cargo containment system having a seal or packing to prevent the escape of cargo, such as a valve, cargo pump, or cargo vapor compressor.

"Cargo piping system" means a tankship's permanently installed piping arrangement, including any valves and pumps, that carries cargo to or from a cargo tank.

"Cargo tank" means a tank that—

(1) Is part of or permanently affixed to a tankship; and

(2) Carries a cargo described in § 153.5 in any quantity, including residual liquid or vapor.

"Closed gauging system" means an arrangement for gauging the amount of cargo in a tank, such as a float and tape or a magnetically coupled float and indicator, that does not have any opening through which cargo vapor or liquid can escape.

"Combustible" is defined in § 30.10–15 of this chapter.

"Commandant" means Commandant of the U.S. Coast Guard.

The term is often followed by a mailing code in parentheses. The mailing address should include any mailing code and should be written as follows:

Commandant (mailing code), U.S. Coast Guard, Washington, D.C. 20590.

"Dedicated ballast tank" means a tank that is used only for clean ballast.

"Emergency shutdown station" means a part of the tankship where the required emergency shutdown controls are clustered.

"Flammable" is defined in § 30.10–22 of this chapter.

"Forward perpendicular" is defined in § 42.13–15(b) of this chapter.

"IMCO" means the Inter-Governmental Maritime Consultative Organization.

"IMCO Certificate" means a Certificate of Fitness for the Carriage of Dangerous Chemicals in Bulk issued under the IMCO *Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk*, Resolution A.212 (VII), 1971.

"Independent tank" means a cargo tank that is permanently affixed to the vessel, that is self-supporting, that incorporates no part of the vessel's hull and that is not essential to the integrity of the hull.

"Intank cargo pump" means a pump—

(1) Located within the cargo tank it serves; and

(2) Whose piping passes through only the top of the cargo tank.

"Integral tank" means a cargo tank that also is part of or is formed in part by the vessel's hull structure so that the tank and the hull may be stressed by the same loads.

"L" means the length of the vessel in meters and is defined in § 42.13–15(a) of this chapter.

"Letter of Compliance" means a letter issued by the Commandant (G–MHM) permitting a foreign flag tankship to carry a bulk cargo regulated under this part.

"Marine Inspector" is defined in § 30.10–43 of this chapter.

"Master" means the master of a tankship of 100 gross tons or more or the operator of a tankship of less than 100 gross tons.

"Open gauging" means an arrangement for gauging the amount of cargo in a tank through a large opening, such as a tank hatch or ullage opening.

"Open venting system" means a venting system that always allows vapor to flow freely to and from the tank.

"Phosphoric acid" means phosphoric acid, superphosphoric acid, and aqueous solutions of phosphoric acid.

"Pressure-vacuum (PV) valve" means a valve that is normally closed and which opens under a preset positive pressure or a vacuum.

"Pumproom" means any enclosed space containing a pump that is part of a cargo containment system.

"Refrigerated tank" means a cargo tank that is equipped to carry a cargo that must be cooled in order to keep the cargo's vapor pressure from exceeding the tank's pressure-vacuum or safety relief valve setting under ambient conditions of 32° C (approx. 90° F) still water and 46° C (approx. 115° F) still air.

"Relief valve setting" means the inlet line pressure at which a vent system's pressure-vacuum or safety relief valve fully opens.

"Restricted gauging system" means a method of gauging the amount of cargo in a tank through an opening of limited size that does not vent the tank's vapor space, such as an unperforated sounding tube.

"Safety relief (SR) valve" means a normally closed valve that opens under a preset positive pressure.

"Service spaces" mean spaces outside the cargo area used for galleys, pantries containing cooking appliances, lockers, store rooms, workshops other than those forming part of machinery spaces, and trunks to such spaces.

"SR venting system" means a venting system in which an SR valve controls vapor flow from the cargo tank.

"Tankship" means any self-propelled vessel having on board a permanently affixed tank that contains a cargo described in § 153.5 in any quantity, including residual liquid or vapor.

"Venting system" means a permanent piping arrangement leading from a cargo tank and used to control the flow of vapor to and from the tank.

§ 153.5 Carriage of hazardous or flammable cargo in bulk.

(a) A hazardous or flammable cargo listed in table I may be carried in bulk on board self-propelled vessels if the requirements of this part are met.

(b) When authorized by the Commandant (G–MHM), a hazardous or flammable cargo not listed in table I, table 4 of part 154, or in § 30.25–1 of this chapter may be carried in bulk on board a self-propelled vessel if the requirements of this part and any additional requirements for the cargo that the Commandant (G–MHM) may prescribe are met.

§ 153.7 Existing tankships.

(a) *Definitions.*

(1) "Permit" means a Certificate of Inspection or a Letter of Compliance.

(2) "Existing tankship" means a tankship for which a contract was let on or before December 27, 1977.

(b) *Endorsements for existing tankships.*

(1) The Coast Guard endorses the permit of an existing tankship to carry a cargo listed in table I if—

(i) The tankship held a permit on December 27, 1977, endorsed for the cargo in question;

(ii) The tankship meets the construction standards under which the Coast Guard issued the permit; and

(iii) The tankship meets the standards in paragraph (c) of this section.

(2) The Coast Guard endorses the permit of an existing tankship to carry a cargo listed in table I if—

(i) The tankship held a permit on December 27, 1977;

(ii) The Coast Guard did not require the permit to be endorsed with the name of the cargo at any time before December 27, 1977;

(iii) The tankship meets the construction standards under which the Coast Guard issued the permit;

(iv) The tankship carried the cargo in question; and

(v) The tankship meets the standards in paragraph (c) of this section.

(3) The Coast Guard endorses the permit of an existing tankship to carry a cargo listed in table I if—

(i) The tankship held a permit on December 27, 1977 endorsed to carry class B or C poisons under 46 CFR part 39;

(ii) The cargo in question is a class B or C poison;

(iii) The tankship meets the construction standards in 46 CFR part 39; and

(iv) The tankship meets the standards in paragraph (c) of this section.

(4) The Commandant (G–MHM) endorses on a case by case basis the permit of an existing tankship to carry a cargo listed in table I if—

(i) The tankship does not come within the categories described in subparagraphs (1) through (3) above;

(ii) The tankship meets paragraph (c) of this section; and

(iii) The tankship meets any additional requirements the Commandant (G–MHM) may prescribe.

(c) *Requirements for existing tankships.* In addition to the standards required of existing tankships in paragraph (b) of this section, every existing tankship must meet the sections of this part according to the following schedule:

(1) The following sections in this part apply to an existing tankship after December 27, 1977: 153.1, 153.2, 153.5, 153.7, 153.8, 153.9, 153.10, 153.208, 153.214, 153.294, 153.515, 153.520, 153.530, 153.559, and subpart C.

(2) After April 12, 1978, an existing tankship must meet all the requirements of this part except as described in subparagraphs (3), (4), (5), and (6) of this section.

(3) The Commandant (G–MHM) considers on a case by case basis endorsing as a type II containment system one that fails to meet §§ 153.21, 153.231(b), and 153.234 if the tankship and containment system meet the following minimum conditions:

(i) The tankship has a loadline certificate.

(ii) The cargo tank is not part of the tankship's shell plating.

(iii) The distance between the bottom plating of the cargo tank and the bottom shell plating of the tankship is at least 76 cm measured parallel to the vertical axis of the tankship.

(4) The Commandant (G–MHM) considers on a case by case basis endorsing a containment system as a type II containment system if—

(i) The containment system is modified after December 27, 1977 to meet § 153.231(b) by adding double bottoms or wing tanks; and

(ii) The tankship can survive the damage described in §§ 153.32 and 153.34 to those parts of the tankship other than machinery spaces.

(5) The Commandant (G–MHM) considers on a case by case basis endorsing as a type III containment system one that does not meet §§ 153.22 and 153.234 if the tankship has a loadline certificate.

(6) The Commandant (G–MHM) considers on a case by case basis extending beyond April 12, 1978 the time an existing tankship may operate before meeting the requirements effective on that date.

§ 153.8 U.S. flag vessel endorsement application.

(a) A person who desires the endorsement required by § 153.900 for a U.S. flag vessel must submit an application to one of the Coast Guard offices described in § 91.55–15 of this chapter, requesting endorsement of the vessel's subchapter D Certificate of Inspection.

(b) The person requesting an endorsement under paragraph (a) of this section must transmit to the Coast Guard when requested—

(1) Hull type calculations;

(2) The plans and information listed in §§ 54.01–18, 56.01–10, 91.55–5(a), (b), (d), (g), and (h), and 111.05–5(d) of this chapter; and

(3) Any other vessel information, such as plans, design calculations, test results, certificates, and manufacturer's data, that the Coast Guard needs to determine that the vessel meets the standards of this part.

§ 153.9 Applications for Letters of Compliance.

(a) *Letter of Compliance applications for a vessel whose flag administration issues IMCO certificates.* A person who desires the endorsed Letter of Compliance described by § 153.900 for a vessel whose flag administration issues IMCO certificates must submit to the Commandant (G–MHM) an application that includes the following:

(1) The vessel's IMCO Certificate.[2]

(2) The vessel's Cargo Ship Safety Construction Certificate and Cargo Ship Safety Equipment Certificate issued under the International Convention for Safety of Life at Sea, 1960.

(3) A general arrangement plan.

(4) A capacity plan.

(5) A midship section plan.

(6) A diagram of cargo piping on deck and in tanks, including all valves and pumps (schematic).

(7) A diagram of cargo tank vent piping, including location of relief valves and flame screens (schematic).

(8) A fire fighting and safety plan.

(9) A description of tank liquid level gauging systems.

(10) Details of tank cooling, heating, and inerting systems.

(b) *Letter of Compliance applications for a vessel whose flag administration does not issue IMCO Certificates.* A person who desires the endorsed Letter of Compliance described by § 153.900 for a vessel whose flag administration does not issue IMCO Certificates must submit to the Commandant (G–MHM) an application that includes the following:

(1) A copy of the vessel's Cargo Ship Safety Construction Certificate and Cargo Ship Safety Equipment Certificate issued under the International Convention for Safety of Life at Sea, 1960.

(2) A list of those cargoes for which the Letter of Compliance is to be endorsed.

(3) The specific tanks that are to be endorsed for each cargo.

(4) The names of the U.S. ports in which the person anticipates operating the vessel.

(5) The name of the vessel's flag administration.

(6) The name of the society that classes the vessel.

(7) A brief description of the vessel's cargo containment systems.

(8) Hull type calculations.

(9) The plans and information listed in §§ 54.01–18, 56.01–10, 91.55–5 (a), (b), (d), (g), and (h), and 111.05–5(d) of this chapter.

(c) *Conditions applying to all Letter of Compliance applications.* If requested by the Commandant (G–MHM), a person desiring a Letter of Compliance for a vessel must furnish any other vessel information, such as plans, design calculations, test results, certificates, and manufacturer's data, that the Coast Guard needs to determine that the vessel meets the standards of this part.

§ 153.10 Equivalent standards.

(a) A vessel that does not meet each standard required in this part for an endorsement on a Certificate of Inspection or Letter of Compliance may meet an alternate standard if the Commandant finds that the alternate standard provides an equivalent or greater level of protection for the purpose of safety.

(b) The Commandant considers on a case by case basis the issuance of a determination of equivalence to a standard required by this part if the person requesting the determination sends a written application to Commandant (G–MHM) that includes—

(1) A detailed explanation of the vessel's characteristics that do not meet the requirements in this part; and

(2) An explanation of how the substituted standards enable the vessel to meet a level of safety equivalent to the standards of this part.

§ 153.12 IMCO Certificates for U.S. flag vessels.

(a) The Coast Guard Officer in Charge of Marine Inspection issues an IMCO Certificate to a U.S. flag tankship if the—

(1) Tankship's owner or representative requests an IMCO Certificate for the tankship;

(2) The tankship meets the recommendations in the IMCO Chemical Code; and

(3) The tankship meets the requirements of this part.

(b) The IMCO Certificate expires on the day when the tankship's Certificate of Inspection expires.

[2] Generally, the IMCO Certificate is sufficient for the Coast Guard to endorse the vessel's Letter of Compliance with the names of those cargoes in table I that are listed on the IMCO Certificate. The IMCO Certificate would not be sufficient when the Certificate authorizes a cargo that is not permitted in U.S. waters, when the Certificate is in error or waives part of the Code, when the regulations in this part exceed those of the Code, or similar situations.

TABLE 1—TABLE OF MINIMUM REQUIREMENTS

Cargo name	Cargo containment system [1]	Vent height [2]	Vent [3]	Gage [4]	Fire protection system [5]	Special requirements	Electrical hazard group and class [6]
Acetic acid	III	4 m	PV	Restr.	A	.238(a), .554	I-D
Acetic anhydride	II	4 m	PV	Restr.	A	.238(a), .526, .554,	I-D
Acetone cyanohydrin	II	B/3	PV	Closed	A	.238(a), .316, .336, .408, .525, .526, .912(b), .933, .1020, .1035	
Acetonitrile	II	B/3	PV	Restr.	A	.336, .525, .520, .1020	I-D
Acrylic acid	III	4 m	PV	Restr.	A	.238(a), .526, .912(a)	I-D
Acrylonitrile	II	B/3	PV	Closed	A	.236 (a), (c), (d), .316, 336, .408, .525, .520, .912(a), .1020	I-D
Adiponitrile	III	4 m	PV	Restr.	A	.526	
Allyl alcohol	II	B/3	PV	Closed	A	.316, .336, .408, .525, .526, .933, .1020	I-C
Allyl chloride	II	B/3	PV	Closed	A	.316, .336, .408, .525, .526, .1020	I-D
Aminoethylethanolamine	III	NR	Open	Open	A	.236 (a), (b), (c), (g)	
Ammonium hydroxide (28 pct or less NH_3).	III	4 m	PV	Restr.	C	.236 (b), (c), (f), .526	I-D
Aniline	II	B/3	PV	Closed	A	.316, .336, .408, .525, .526, .933, .1020	
Benzene	III	B/3	PV	Restr.	B	.316, .526	I-D
Benzyl chloride	II	B/3	PV	Closed	B	.316, .336, .408, .525, .526, .912(b), .1020	
(iso-, n-) Butyl Acrylate	II	4 m	PV	Restr.	A	.526, .912(a)	I-D
(iso-, n-, sec-, tert-) Butylamine.	II	B/3	PV	Closed	A	.236 (b), (c), .336, .408, .525, .526, .1020	
(n-) Butyl ether	III	B/3	PV	Closed	A	.500, .525, .526, .1020	
Butyl methacrylate	III	4 m	PV	Restr.	B	.526, .912(a)	
(iso-, n-, crude) butyraldehyde	III	4 m	PV	Open	A	.526	I-C
Camphor oil	III	4 m	PV	Open	B	None	I-D
Carbolic oil	II	B/3	PV	Closed	A	.408, .525, .526, .933, .1020	
Carbon disulfide	II	B/3	PV	Closed	C	.236(c), .252, .408, .500, .515, .520, .525, .526, .1020, .1040	(7)
Carbon tetrachloride	III	B/3	PV	Closed		.316, .336, .408, .525, .526, .1020	
Caustic potash solution	III	NR	Open	Open		.236 (a), (c), (g), .933	
Caustic soda solution	III	NR	Open	Open		.236 (a), (c), (g), .933	
(mono-) Chlorobenzene	III	4 m	PV	Restr.	B	.526	I-D
Chloroform	III	B/3	PV	Restr.		.525, .526, .1020	
(crude) Chlorohydrins	II	B/3	PV	Closed	A	.408, .525, .526, .1020	I-D
Chloroprene	II	B/3	Pv	Closed	B	.316, .336, .525, .526, .912(a), .1020	
Chlorosulfonic acid	I	B/3	PV	Closed		.408, .525, .526, .554, .555, .933, .1000, .1020, .1045.	
Coal tar naphtha	III	4 m	PV	Restr.	A	.526	I-D
Creosote	III	NR	Open	Open	B	.400	
Cresols	III	NR	Open	Open	B	None	

Footnotes at end of table.

TABLE 1—TABLE OF MINIMUM REQUIREMENTS

Cargo name	Cargo containment system [1]	Vent height [2]	Vent [3]	Gage [4]	Fire protection system [5]	Special requirements	Electrical hazard group and class [6]
Crotonaldehyde	II	B/3	PV	Restr.	A	.316, .336, .525, .526, .1020	I–C
Cyclohexanone	III	4 m	PV	Restr.	A	.236 (a), (b), .526	I–D
Cyclohexylamine	III	4 m	PV	Restr.	A	.236 (a), (b), (c), (g), .526	
(iso-, n-) Decyl acrylate	III	NR	Open	Open	A, C	.236 (b), (c), .912(a)	
Dibutylamine	III	4 m	PV	Restr.	B	.236 (b), (c), .526	
Dichlorobenzene	III	4 m	PV	Restr.	B	.236 (a), (b), .526	
1,1-Dichloroethane	III	4 m	PV	Restr.	B	.526	
2,2'-Dichloroethyl ether	II	4 m	PV	Restr.	A	.236 (a), (b), .526	I–D
Dichloromethane	III	4 m	PV	Restr.		.526	
1,1- or 1,2-Dichloropropane	II	B/3	PV	Restr.	B	.525, .526, .1020	I–D
1,3 Dichloropropene	II	B/3	PV	Closed	B	.316, .336, .408, .525, .526, .1020	I–D
Diethanolamine	III	NR	Open	Open	A	.236 (b), (c)	
Diethylamine	III	B/3	PV	Restr.	A	.236 (a), (b), (c), (g), .525, .526, .1020	I–C
Diethylenetriamine	III	NR	Open	Open	A	.236 (b), (c)	
Diethylethanolamine	III	4 m	PV	Restr.	A	.236 (a), (b), (c), (g), .526	
Diisopropanolamine	III	NR	Open	Open	A	.236 (b), (c)	I–D
Diisopropylamine	II	B/3	PV	Closed	A	.236 (b), (c), .408, .525, .526, .1020	I–C
Dimethylamine (40 pct or less)	III	B/3	PV	Restr.	A, C	.236 (a), (b), (c), (d), .525, .526, .1020	I–C
Dimethylethanolamine	III	4 m	PV	Restr.	A	.236 (b), (c), .526	
Dimethylformamide	III	4 m	PV	Restr.	A	.236 (b), .526	
1,4-Dioxane	II	B/3	PV	Closed	A	.408, .525, .526, .1020	I–C
Epichlorohydrin	II	B/3	PV	Closed	A	.316, .336, .408, .525, .526, .1020	I–C
Ethanolamine	III	NR	Open	Open	A	.236 (b), (c), .526	
Ethyl acrylate	II	4 m	PV	Restr.	A	.526, .912(a)	I–D
Ethylene chlorohydrin	II	B/3	PV	Closed	A, C	.316, .336, .408, .525, .526, .933, .1020	
Ethylene cyanohydrin	III	NR	Open	Open	A	None	I–D
Ethylenediamine	II	4 m	PV	Restr.	A	.236 (b), (c), .526	I–D
Ethylene dibromide	II	B/3	PV	Closed		.408, .525, .526, .1020	
Ethylene dichloride	II	4 m	PV	Restr.	B	.236(b), .409, .526	I–D
Ethyl ether	II	4 m	PV	Closed	A	.236(g), .252, .408, .500, .515, .526	I–C
2-Ethylhexyl acrylate	III	NR	Open	Open	A	.912(a)	
Ethyl methacrylate	III	4 m	PV	Restr.	B	.912(a), .526	
2-Ethyl-3-Propyl acrolein	III	4 m	PV	Restr.	A	.526	
Formaldehyde solution (37 to 50 pct).	III	4 m	PV	Restr.	A	.526	I–C
Formic acid	III	4 m	PV	Restr.	A	.238 (b), (c), .526, .554	
Furfural	III	4 m	PV	Restr.	A	.526	
Hydrochloric acid	III	4 m	PV	Restr.		.252, .526, .554, .555, .557, .933, .1045, .1052	
2-Hydroxyethyl acrylate	II	B/3	PV	Closed	A	.408, .525, .526, .912(a), .933, .1020	
Isoprene	III	4 m	PV	Restr.	B	.912(a)	I–C
Mesityl oxide	III	4 m	PV	Restr.	A	.409, .526	I–D
Methyl acrylate	II	4 m	PV	Restr.	B	.526, .912(a)	I–D
2-Methyl-5-Ethyl pyridine	III	NR	Open	Open	A	.236(b)	
Methyl methacrylate	II	4 m	PV	Restr.	B	.526, .912(a)	I–D
(alpha-) Methyl styrene	III	4 m	PV	Restr.	B	.526, .912(a)	

Footnote at end of table.

TABLE 1—TABLE OF MINIMUM REQUIREMENTS

Cargo name	Cargo containment system [1]	Vent [2] height	Vent [3]	Gage [4]	Fire protection system [5]	Special requirements	Electrical hazard group and class [7]
Morpholine	III	4 m	PV	Restr.	A	.236 (b), (c)	I–C
Motor fuel anti-knock compounds (containing lead alkyls).	II	B/3	PV	Closed	B, C	.252, .336, .408, .525, .526, .933, .1020, .1025	
Naphthalene (liquid)	III	4 m	PV	Restr.	B, C	None	
Nitric acid (70 pct or less)	II	4 m	PV	Restr.		.408, .526, .554, .555, .559, .933, .1045	
(mono-) Nitrobenzene	II	B/3	PV	Closed	B, C	.316, .336, .408, .525, .933, .1020	
1- or 2-Nitropropane [8]	III	4 m	PV	Restr.	A [9]	.526, .600, .1055	I–C
(ortho-, para-) Nitrotoluene	II	B/3	PV	Closed	B	.316, .336, .408, .525, .526, .1055	
Oleum	II	B/3	PV	Closed		.316, .336, .408, .526, .554, .555, .556, .933, .1000, .1045, .1052	
Paraldehyde	III	4 m	PV	Restr.	A	None	
Pentachloroethane	III	B/3	PV	Restr.		.316, .336, .525, .526, .1020	
Phenol	II	B/3	PV	Closed	A	.408, .525, .526, .933, .1020	
Phosphoric acid	III	NR	Open	Open		.554, .555, .558, .1045, .1052	
Phthalic anhydride (liquid).	III	4 m	PV	Restr.	D	None	
(iso-,n-) Propanolamine	III	NR	Open	Open	A	.236 (b), (c), .526	
Propionic acid	III	4 m	PV	Restr.	A	.236(a), .554	I–D
Propionic anhydride	III	4 m	PV	Restr.	A	.236(a), .556	
(iso-,n-) Propylamine	II	B/3	PV	Closed	C	.236 (b), (c), .408, .500, .525, .526, .1020, .1060	I–D
Propylene oxide	II	4 m	PV	Closed	A	.500, .526, .530, .1010, .1011	I–B
Pyridine	III	4 m	PV	Restr.	A	.236(b)	
Sodium hydrosulfide solution (45 pct or less).	III	4 m	PV	Restr.		.526, .933	
Sodium hypochlorite solution (15 pct or less).	III	4 m	PV	Restr.		.236 (a), (b)	
Styrene	III	4 m	PV	Open	B	.236(b), .912(a)	I–D
Sulfur (liquid)	III	NR	Open	Open		.252, .526, .545	
Sulfuric Acid	III	NR	Open	Open		.554, .555, .556, .933, .1000, .1045, .1046, .1052	
1,2,2,2-Tetrachloroethane	III	B/3	PV	Restr.		.316, .336, .525, .526, .1020	
Tetraethylenepentamine	III	NR	Open	Open	A	.236 (b), (c)	
Tetrahydrofuran	III	4 m	PV	Restr.	A, D	.526, .912(b)	I–C
Toluene Diisocyanate	II	B/3	PV	Closed	C, D	.236(b), .316, .408, .500, .501, .525, .526, .1000, .1020,	
Trieresyl phosphate (containing 1 pct or more of the ortho isomer).	II	4 m	PV	Closed	B	.408, .525(a), .1020	
Triethanolamine	III	NR	Open	Open	A	.236 (a), (b), (c), (g)	
Triethylamine	II	B/3	PV	Restr.	B	.236 (b), (c), .525, .526, .1020	I–C
Triethylenetetramine	III	NR	Open	Open	A	.236 (a), (b), (c)	
Urea, ammonium nitrate solution (containing more than 2 pct NH_3).	III	4 m	PV	Restr.	A	.236(b), .526	I–D
(iso-,n-) Valeraldehyde	III	4 m	PV	Restr.	A	.500, .526,	I–C
Vinyl acetate	III	4 m	PV	Open	A	.912(a)	I–D
Vinylidene chloride	II	4 m	PV	Restr.	B	.236 (a), (b), .500, .526, .912(a),	I–D
Vinyl ethyl ether	II	4 m	PV	Closed	A	.236 (b), (f), (g), .408, .500, .515, .526, .912(a),	
Vinyl toluene	III	4 m	PV	Restr.	B	.236 (a), (e), (g), .912(a)	I–D

For details see these sections
[1] 153.230–153.232.
[2] 153.300–153.351.
[3] 153.355.
[4] 153.400–153.406.
[5] 153.460.
[6] 46 CFR 111.80–5.
[7] 153.520(b).
[8] Dry chemical extinguishers should not be used on nitropropane fires because some dry chemicals may react with nitropropane and make the fire worse.

NOTES ON TABLE 1

Cargo containment system—The containment system type, either I, II, or III, is listed. See secs. 153.230 through 153.232.

Vent heights—The location and height of the vent riser is described in terms of the vent height, either B/3 or 4 m. See secs. 153.350 and 153.351.

Vent—The type of venting control valve, either pressure vacuum (PV) or open, is listed. See sec. 153.355.

Gauge—The type of gauge, either closed, restricted (Restr.), or open, is listed. See secs. 153.400–153.406.

Fire protection system—The type of fire protection system is shown, where: A is a foam system for water soluble cargoes (polar solvent foam), B is a foam system for water insoluble cargoes (nonpolar solvent form), C is a water spray system, and D is a dry chemical system.

Unless table 1 specifies a dry chemical (D) system as an option, a dry chemical system may be substituted for an A or B type system only if the Commandant (G–MMT) approves the substitution.

Special requirement—The special requirements are shown by the digits of the section numbers, without the "153" part number preceding them.

Electrical hazard group and class—This column is for use with subchapter J (Electrical Engineering) of this chapter.

NOTE.—See app. I of this part for a list of cargoes to which neither this part nor subch. D (tank vessels) of this chapter apply.

Subpart B—Requirements

GENERAL

§ 153.15 Requirements for U.S. flag vessel permits.

To have its Certificate of Inspection endorsed with the name of a cargo listed in table I, a U.S. flag vessel must meet the requirements for the cargo in this subpart.

§ 153.16 Requirements for foreign flag vessel permits.

To have its Letter of Compliance endorsed with the name of a cargo listed in table I, a foreign flag vessel must:

(a) Have an IMCO Certificate, if the flag administration issues IMCO Certificates, endorsed with the name of the cargo and meet any specific requirements in this subpart that the Commandant (G–MHM) may prescribe; or

(b) Meet the requirements of this subpart and § 30.01–5(e) of this chapter.

HULL TYPE CALCULATIONS

§ 153.20 Type I hull calculations.

Calculations for a type I hull must show that it can survive damage as described in §§ 153.32 and 153.34 to any location.

§ 153.21 Type II hull calculations.

(a) Calculations for a type II hull 150 m (approx. 492 ft) or less in length must show that it can survive damage described in §§ 153.32 and 153.34 to any location except the transverse bulkheads bounding an aft machinery space.

(b) Calculations for a type II hull greater than 150 m (approx. 492 ft) in length must show that it can survive damage described in §§ 153.32 and 153.34 to any location.

§ 153.22 Type III hull calculations.

(a) Calculations for a type III hull less than 125 m (approx. 410 ft) in length must show that it can survive damage described in §§ 153.32 and 153.34 to any location except to an aft machinery space.

(b) Calculations for a type III hull 125 m (approx. 410 ft) or greater in length must show that it can survive damage as described in §§ 153.32 and 153.34 to any location except the transverse bulkheads bounding an aft machinery space.

§ 153.30 Permeability of spaces.

(a) As used in this section, "permeability of a floodable space" means the ratio of the volume within the space that is assumed to be occupied by water to the total volume of the space.

(b) The permeability of a floodable space must be assumed as follows:

(1) Machinery spaces: 0.85 unless a permeability of less than 0.85 is justified in detail.

(2) Storerooms: 0.60.

(3) Accommodation spaces: 0.95.

(4) Voids: 0.95.

(5) Tanks containing consumable liquids: 0.95 or 0.0, whichever is the more disabling.

(6) Tanks containing liquids other than consumables: 0.95 or 0.0, the permeability of partially filled tanks to be consistent with the density and amount of liquid carried in the tank.

(c) If a cargo tank would be penetrated under the assumed damage, the cargo tank must be assumed to lose all cargo and refill with salt water up to the level of the tankship's final plane of equilibrium.

§ 153.31 Free surface effect.

(a) The virtual increase in the vertical center of gravity of the tankship due to a liquid in a space must be determined by calculating either:

(1) The free surface effect with the ship assumed heeled 5° from the vertical; or

(2) The shift of the center of gravity of the liquid by the moment of transference method.

(b) In calculating the free surface effect of consumable liquids, the following must be done:

(1) For each type of liquid, at least one transverse pair of wing tanks or a single centerline tank must be assumed to have a free surface.

(2) Of the two assumptions in subparagraph (1), the one having the greater free surface effect must be chosen.

§ 153.32 Damage.

(a) Calculations must assume both collision and grounding damage, separately; and the damage must consist of the most disabling penetration up to and including penetrations having the following dimensions:

(1) Collision penetration:		
(i) Longitudinal extent		(1/3)$L^{2/3}$ or 14.5 m (approx. 0.405$L^{2/3}$ or 47.6 ft), whichever is less.
(ii) Transverse extent: (inboard from the ship's side at right angles to the centerline at the level of the summer loadline assigned under subchapter E).		B/5 or 11.5 m (approx. 37.7 ft), whichever is less.
(iii) Vertical extent		From the base line upwards without limits.
(2) Grounding penetration:		
At the forward end but excluding any damage aft of a point 0.3L aft of forward perpendicular.		At any other longitudinal position.
(i) Longitudinal	L/10	L/10 or 5 m (approx. 16.4 ft), whichever is less.
(ii) Transverse	B/6 or 10 m (approx. 32.8 ft), whichever is less.	5 m (approx. 16.4 ft).
(iii) Vertical extent from the base line.	B/15 or 6 m (approx. 19.7 ft), whichever is less.	B/15 or 6 m (approx. 19.7 ft), whichever is less.

(b) If the damage assumption excludes a transverse bulkhead bounding a machinery space, the machinery space must be assumed to be flooded as a case separate from the damage assumption.

(c) Damage must be assumed to include transverse bulkheads spaced more closely than the longitudinal extent of damage specified in paragraphs (a) (1) (i) and (a) (2) (i) of this section.

§ 153.34 Survival.

A tankship is presumed to survive if it meets the following conditions:

(a) *Heel angle.* (1) Except as described in paragraph (a) (2) of this section, in the final condition of flooding the angle of heel must not exceed 15° (17° if no part of the freeboard deck is immersed).

(2) The Commandant (G–MMT) considers on a case by case basis vessels 150m or less in length having heel angles greater than 17° but less than 25°.

(b) *Final waterline.* The final waterline, taking into account sinkage, heel, and trim, must be below the lower edge of openings such as air pipes and openings closed by weathertight doors or hatch covers. The following types of openings may be submerged when the tankship is at the final waterline:

(1) Openings covered by watertight manhole covers or watertight flush scuttles.

(2) Small watertight cargo tank hatch covers.

(3) Remotely operated watertight sliding doors.

(4) Side scuttles of the non-opening type.

(c) *Range of stability.* Through an angle of 20° beyond its position of equilibrium after flooding, a tankship must meet the following conditions:

(1) The righting lever curve must be positive.

(2) The maximum of the righting lever curve must be at least 10 cm (approx. 4 in.).

(3) Each submerged opening must be weathertight.

(d) *Metacentric height.* After flooding, the tankship's metacentric height must be at least 5 cm (approx. 2 in.) when the ship is in the upright position.

(e) *Watertight superstructure.* Watertight superstructure beyond the extent of damage adds to the stability of the tankship only if it is separated from the damaged space by a watertight bulkhead.

(f) *Progressive flooding.* Pipes, ducts, or tunnels within the assumed extent of damage must be either:

(1) Equipped with arrangements such as stop check valves to prevent progressive flooding in other spaces with which they connect; or

(2) Assumed to flood the spaces with which they connect.

(g) *Equalization arrangements.* Flooding equalization arrangements requiring mechanical operation such as valves or cross flooding lines may not be assumed to reduce the angle of heel. (However, note that spaces joined by ducts of large cross section may be assumed to be common spaces.)

(h) *Intermediate stages of flooding.* If it is not clear that a tankship meets the requirements of this section throughout intermediate stages of flooding, the shipowner shall furnish calculations showing that the tankship meets these requirements in intermediate flooding if requested by the Commandant (G–MMT).

§ 153.35 Loadline requirements.

A vessel that meets §§ 153.20, 153.21, or 153.22 also meets § 42.20–5 of this chapter.

General Vessel Arrangements

§ 153.200 Portlights, wheelhouse windows, and wheelhouse doors.

(a) In this section, "hosetight" means tight when tested with a firehose at not less than 207 kPa gauge (approx. 30 psig).

(b) Except as permitted under paragraph (c),

(1) Each portlight must be fixed and hosetight; and

(2) Each wheelhouse window and door must be hosetight.

(c) The following are not required to meet paragraph (b):

(1) Portlights, wheelhouse windows, wheelhouse portlights, and wheelhouse doors on the after bulkhead of a superstructure or deckhouse.

(2) Portlights, wheelhouse windows, wheelhouse portlights, and wheelhouse doors on the outboard side of a deckhouse or superstructure and the greater of L/25 or 3.05 m (approx. 10 ft) aft, measured from the aftermost forward bulkhead of the deckhouse.

§ 153.202 Location of doors and airports on deckhouses and superstructures.

Doors and airports on a deckhouse or superstructure must be on its aft or outboard side and, if on the side, at least L/25 but no less than 3.05 m (approx. 10 ft) aft, measured from the aftermost forward bulkhead of the deckhouse.

§ 153.208 Ballast equipment.

(a) Except for the arrangement described in paragraph (b), no piping that serves a dedicated ballast tank that is adjacent to a cargo tank may enter an engine room or accomodation space.

(b) Piping used only to fill a dedicated ballast tank adjacent to a cargo tank may enter an engine room or accommodation space if the piping has a valve or valving arrangement:

(1) Within the part of the tankship where a containment system may be located under § 153.234;

(2) That allows liquid to flow only towards that ballast tank (such as a check valve); and

(3) That enables a person to shut off the fill line from the weatherdeck (such as a stop valve).

(c) Piping, pumps and vent lines serving a dedicated ballast tank may not be located within a cargo containment system.

§ 153.209 Bilge pumping systems.

Bilge pumping systems for cargo pumprooms, slop tanks, and void spaces separated from cargo tanks by only a single bulkhead must be entirely within the locations allowed containment systems in §153.234.

§ 153.214 Personnel emergency and safety equipment.

Each tankship must have the following: (a) Two stretchers or wire baskets complete with equipment for lifting an injured person from a pumproom or a cargo tank.

(b) In addition to any similar equipment required by subchapter D of this chapter, three each of the following:

(1) A 30 minute self-contained breathing apparatus of the pressure demand type, approved by the Mining Enforcement and Safety Administration and the National Institute for Occupational Safety and Health, or the tankship's flag administration with five refill tanks or cartridges of 30 minutes capacity each.

(2) A set of coveralls or large apron, boots, long sleeved gloves, and goggles, each made of materials resistant to the cargoes in table I that are endorsed on the Certificate of Inspection or Letter of Compliance.

(3) A steel-cored lifeline with harness.

(4) An explosion-proof lamp.

(c) A first aid kit approved by the Mining Enforcement and Safety Administration and the National Institute for Occupational Safety and Health, or the tankship's flag administration for the number of crewmen normally aboard the vessel.

(d) A portable oxygen inhalator and bag valve mask manual resuscitator.

§ 153.215 Safety equipment lockers.

(a) Each tankship must have at least two safety equipment lockers.

(b) One safety equipment locker must be adjacent to the emergency shutdown station required by § 153.296(b). This locker must contain one set of the equip-

ment required by § 153.214(a) and two sets of that required by § 153.214(b).

(c) The second safety equipment locker must be adjacent to the second emergency shutdown station required by § 153.296(b). This locker must contain the remaining equipment required by § 153.214 (a) and (b).

(d) Each safety equipment locker must be marked as described in § 153.955 (c), (d), and (e) with the legend "SAFETY EQUIPMENT."

§ 153.216 Shower and eye wash fountains.

Each tankship must have a shower and an eye wash fountain that:

(a) Operate in any ambient temperature;

(b) Are located on the weatherdeck; and

(c) Are marked "EMERGENCY SHOWER" as described in § 153.955 (c), (d), and (e), so that the legend is visible from work areas in the part of the deck where the cargo containment systems are located.

§ 153.217 Access to void spaces.

Any access opening to a void space must meet the requirements for a cargo tank access in §§ 153.254 (b), (c), and (d) if:

(a) The void space is adjacent to a cargo containment system; or

(b) A part of a cargo containment system lies within the void space.

CARGO CONTAINMENT SYSTEMS

§ 153.230 Type I system.

A type I containment system must meet the following requirements:

(a) It must be in a type I hull.

(b) Except as described in § 153.235:

(1) It may be no closer to the tankship's shell than 76 cm (approx. 29.9 in.); and

(2) It may not be located in any part of the tankship subject to the damage described in §§ 153.32(a) (1) (ii) and 153.32(a) (2) (iii).

§ 153.231 Type II system.

A type II containment system must meet the following requirements:

(a) It must be in either a type I or II hull.

(b) Except as described in § 153.235:

(1) It may be no closer to the tankship's shell than 76 cm (approx. 29.9 in.); and

(2) It may not be located in any part of the tankship subject to the damage described in § 153.32(a) (2) (iii).

§ 153.232 Type III system.

A type III containment system must be in either a type I, II, or III hull.

§ 153.233 Separation of tanks from machinery, service, and other spaces.

(a) To prevent leakage through a single weld failure, the following spaces must be separated from a cargo by two walls, two bulkheads, or a bulkhead and a deck not meeting in a cruciform joint:

(1) Machinery spaces.

(2) Service spaces.

(3) Accommodation spaces.

(4) Spaces for storing potable domestic, or feed water.

(5) Spaces for storing edibles.

(b) Some examples of arrangements that may separate cargo from the spaces listed in paragraph (a) of this section are the following:

(1) Dedicated ballast tanks.

(2) Cargo pumprooms.

(3) Ballast pumprooms.

(4) Tanks not carrying a cargo listed in this part.[a]

(5) A cofferdam aft of the cargo containment systems and whose forward bulkhead is forward of any joint common to an accommodations space and the deck.

(6) Double walled piping or a piping tunnel.

§ 153.234 Fore and aft location.

(a) Each cargo containment system and any compartments within which a containment system is located must be forward of a tankship's accommodation spaces.

(b) Except as described in § 153.235, each cargo containment system must be located at least 0.05L aft of the forward perpendicular, but in no case forward of a collision bulkhead.

§ 153.235 Exceptions to cargo piping location restrictions.

Cargo piping must not be located in those areas from which a containment system is excluded by §§ 153.230(b), 153.231(b), and 153.234(b) unless the cargo piping:

(a) Drains back to the cargo tank under any heel or trim resulting from the damage specified in § 153.32; and

(b) Enters the cargo tank above the liquid level for a full tank in any condition of heel or trim resulting from the damage specified in § 153.32.

§ 153.236 Prohibited materials.

When one of the following paragraphs of this section is referenced in table I, the materials listed in that paragraph may not be used in components that contact the cargo liquid or vapor:

(a) Aluminum or aluminum alloys.

(b) Copper or copper alloys.

(c) Zinc, galvanized steel or alloys having more than 10 percent zinc by weight.

(d) Magnesium.

(e) Lead.

(f) Silver or silver alloys.

(g) Mercury.

§ 153.238 Required materials.

When one of the following paragraphs of this section is referenced in table I, only those materials listed in that paragraph may be used in components that contact the cargo liquid or vapor:

(a) Aluminum, stainless steel, or steel covered with a protective lining or coating.

(b) With cargo concentrations of 98 percent or greater, aluminum or stainless steel.

(c) With cargo concentrations of less than 98 percent, 304L or 316 stainless steel.

§ 153.239 Cast iron prohibited.

No gray cast iron may be used in a cargo containment system.

§ 153.240 Insulation.

Cargo containment system insulation made necessary by the requirements of this part must meet the requirements in § 38.05–20 of this chapter. However, the vapor barrier required by § 38.05–20(b) is unnecessary if the insulation is—

(a) Protected from the weather, and attached to a containment system maintained at a temperature in excess of 46° C (approx. 115° F); or

(b) In an atmosphere whose dewpoint is less than the temperature of any surface in contact with the insulation.

CARGO TANKS

§ 153.250 Double-bottom and deep tanks as cargo tanks.

Except in those cases in which Commandant (G–MHM) specifically approves another arrangement, such as a double-bottom or deep tank as a cargo tank, an integral cargo tank or the hold within which an independent cargo tank is located must extend to the weatherdeck.

§ 153.251 Independent cargo tanks.

(a) An independent cargo tank must meet § 38.05–10 (a) (1), (b), (d), and (e) (1) of this chapter, even if the tank is not to be endorsed to carry a cargo requiring an independent tank.

(b) A tank endorsed to carry a cargo requiring an independent cargo tank must meet §§ 38.05–2(d) and 38.05–4(g) of this chapter. (See also § 153.256(b)).

§ 153.252 Special requirement for an independent cargo tank.

When table I refers to this section, the cargo tank must be an independent tank.

§ 153.253 Quick closing shutoff valves required with spill valves.

A cargo tank with a spill valve must have a remotely actuated quick closing shutoff valve in its fill line.

§ 153.254 Cargo tank access.

(a) A cargo tank must have at least one covered manhole opening into the vapor space described in § 153.354.

(b) An access through a vertical cargo tank surface must be at least 60 cm by 80 cm (approx. 23.6×31.5 in.) and no more than 60 cm above a foothold, grating, or surface on both sides of the access way.

(c) An access through a horizontal cargo tank surface must be at least 60 cm by 60 cm (approx. 23.6×31.5 in.).

(d) An access trunk must be no less than 76 cm (approx. 29.9 in.) in diameter.

[a] See also §§ 32.56–5 and 32.60–10 of this chapter for limitations on the stowage of combustible liquids adjacent to ignition sources.

§ 153.256 Trunks, domes, and openings of cargo tanks.

(a) The hatch of a cargo tank must—
(1) Be at the highest point of the tank; and
(2) Open on or above the weatherdeck.
(b) To be endorsed to carry a cargo requiring an independent cargo tank, a tank must have—
(1) A trunk or dome at the uppermost part of the tank, extending above the weatherdeck;
(2) Its hatch at the top of the trunk or dome; and
(3) No openings below the weatherdeck.

§ 153.266 Tank linings.

A tank lining must be—
(a) At least as elastic as the tank material; and
(b) Applied or attached to the tank as recommended by the lining manufacturer.

PIPING SYSTEMS AND CARGO HANDLING EQUIPMENT

§ 153.280 Piping system design.

(a) Each cargo piping system must meet the standards of part 56 and §§ 38.10–1(b), 38.10–1(e), and 38.10–10(a) of this chapter.
(b) Piping carrying cargo or cargo residue may not enter any machinery space except a cargo pumproom.

§ 153.281 Piping to required independent tanks.

An independent cargo tank required by this part must have no piping except through that part of the trunk or dome extending above the weatherdeck.

§ 153.282 Cargo filling lines.

The discharge point of a cargo tank filling line must be no higher above the bottom of the cargo tank or sump than 10 cm (approx. 4 in.) or the radius of the filling line, whichever is greater.

§ 153.283 Valving for cargo piping.

(a) Except as described in this section, a cargo line must have a deck operable, manual stop valve—
(1) In each tank which the line serves; and
(2) At each cargo hose connection point.
(b) The valve required by (a)(1) may be in a cargo pumproom at the pumproom bulkhead if the cargo tank the cargo line serves is adjacent to the pumproom.
(c) The valve required by (a)(1) may be on the weatherdeck if—
(1) The weatherdeck is the top of the tank;
(2) The line goes through the weatherdeck into the tank; and
(3) The valve is at the point where the line penetrates the weatherdeck.
(d) The valve required by (a)(1) may be outside the tank if—
(1) The tank is an independent tank; and
(2) The valve is at the point where the line penetrates the tank.
(e) The discharge line of an intank cargo pump need not have the valve required by (a)(1).

§ 153.284 Characteristics of required quick closing valves.

Remotely actuated quick closing shutoff valves required by this part must—
(a) Be of the fail-closed type that closes on loss of power;
(b) Allow manual operation; and
(c) Operate from fully open to fully closed in no more than thirty seconds.

§ 153.285 Valving for cargo pump manifolds.

(a) When cargo lines serving different tanks enter a pumproom and connect to the same pump—
(1) Each cargo line must have a stop valve within the line;
(2) The valve must be before the cargo line joins the other lines or pump; and
(3) The valve must be within the pumproom.
(b) The valve in paragraph (a) is required in addition to any valve required under § 153.283(b).

§ 153.294 Marking of piping systems.

(a) Each cargo piping system must be marked with the designation number of the cargo tank it serves at each hose connection, valve, and blind in the piping system. The markings must be in characters at least 5 cm (approx. 2 in.) high.
(b) Every hose connection of a cargo piping system must be marked with the cargo piping system's working pressure required by § 38.10–10(a) of this chapter.[4]

§ 153.296 Emergency shutdown stations.

(a) Each tankship must have at least two emergency shutdown stations.
(b) One emergency shutdown station must be located forward of the deckhouse, in the after part of the weatherdeck in which the cargo tanks are located.
(c) An emergency shutdown station must be accessible from any part of the weatherdeck if a break in a cargo piping system or hose causes spraying or leaking.
(d) Each emergency shutdown station must contain a single remote actuator for all quick closing shutoff valves required by this part.
(e) Each emergency shutdown station must have the controls necessary to stop all cargo pumps on the tankship.
(f) Any remote emergency actuator, such as that for a quick closing shutoff valve, a cargo pump, or a water spray system, must be of a type that will not defeat the operation of other remote emergency actuators. The emergency action must occur whether one or several actuators are operated.
(g) Each emergency shutdown station must be marked as described in § 153.955 (c), (d), and (e) with the legend "EMERGENCY SHUTDOWN STATION" so that the legend is visible from work areas in the part of the deck where the cargo containment systems are located.

[4] See § 153.282 of this part.

§ 153.297 Emergency actuators at the point of cargo control.

(a) The point from which cargo transfer is controlled must have the same actuators an emergency shutdown station must have under § 153.296 and an actuator for any deck water spray systems required by this part.
(b) The point from which cargo transfer is controlled may be one of the emergency shutdown stations required under § 153.296 if it meets the requirements of that section.

CARGO HANDLING SPACE VENTILATION

§ 153.310 Ventilation system type.

A cargo handling space must have a permanent forced ventilation system of the exhaust type.

§ 153.312 Ventilation system standards.

A cargo handling space ventilation system must meet the following:
(a) A ventilation system exhaust duct must discharge no less than 10 m (approx. 32.8 ft) from openings into or ventilation intakes for, accommodation or service spaces.
(b) A ventilation system must not recycle vapors from ventilation discharges.
(c) Except for the space served by the ventilation duct, a ventilation duct must not pass through a machinery room, an accommodation space, or working spaces.
(d) A ventilation system must be operable from outside the space it ventilates.
(e) A ventilation system must be sized to change the air in the ventilated space at least 30 times per hour.
(f) A ventilation system must not allow air to stagnate in any part of a ventilated space.
(g) A ventilation system must be able to exhaust air from both above and below the deck plates of a ventilated space.

§ 153.314 Ventilation of spaces not usually occupied.

(a) Each tankship must have portable ventilation equipment that fits the mount required in paragraph (b)(1) of this section.
(b) Each cofferdam, duct keel, pipe tunnel, and cargo tank hold that does not have a permanent ventilation system meeting § 153.312 must have—
(1) A mount for the portable mechanical ventilation equipment required by this section; and
(2) Either permanent ventilation ductwork connected to the mount and arranged to supply air to the extremities of the space; or
(3) An attachment for temporary ductwork at the mount with enough ductway in the ventilated space and temporary ductwork stowed aboard the vessel to supply air to the extremities of the space.

§ 153.316 Special cargo pumproom ventilation rate.

When table I refers to this section, the cargo pumproom ventilation system must change the air in the cargo pumproom 45 times per hour and discharge no less than 4 m (approx. 13.1 ft) above the deck.

CARGO PUMPROOMS

§ 153.330 Access.

(a) The access door to a cargo pumproom must open on the weatherdeck.

(b) The access way to a cargo pumproom and its valving must allow passage of a man wearing the breathing apparatus required by § 153.214(b)(1).

(c) Each ladderway in a cargo pumproom must be free from obstructions by piping, framework, or other equipment.

(d) Cargo pumproom ladders and platforms must have guard railings.

(e) Each ladder to a cargo pumproom must have an incline from the horizontal of less than 60°.

§ 153.332 Hoisting arrangement.

(a) A cargo pumproom located below the weatherdeck must have a permanent hoisting arrangement with a lifting capacity of 2500 N (approx. 562 lbs), operable from the weatherdeck, for the removal of an unconscious person.

(b) The cargo pumproom must have a 60 cm by 60 cm (approx. 2 ft by 2 ft) cross-sectional clearance through the hoistway.

§ 153.333 Cargo pump discharge pressure gauge.

Each cargo pump within a pumproom must have a discharge pressure gauge outside the pumproom.

§ 153.334 Bilge pumping systems.

(a) A cargo pumproom must have a bilge pumping system.

(b) The bilge pumping system must have—

(1) Complete remote operating controls outside the cargo pumproom; and

(2) An alarm that operates when the depth of liquid in the bilges exceeds 50 cm (approx. 19.7 in.).

§ 153.336 Special cargo pump or pumproom location requirements.

When table I refers to this section—

(a) The cargo pump must be an intank cargo pump;

(b) The cargo pumproom must be on or above the weatherdeck; or

(c) The cargo pumproom must have the specific approval of the Commandant (G-MHM).

CARGO VENTING SYSTEMS

§ 153.350 Location of B/3 vent discharges.

(a) A B/3 venting system must discharge at the highest of the following points:

(1) 6 m (approx. 19.7 ft.) above the weatherdeck.

(2) B/3 above the weatherdeck.

(3) 6 m (approx. 19.7 ft.) above a walkway if the walkway is within 6 m (approx. 19.7 ft.) of a line drawn through the vent discharge and perpendicular to the deck.

(b) A B/3 venting system must discharge at least 15 m (approx. 49.2 ft) from air intakes for, or openings into, accommodation and service spaces.

§ 153.351 Location of 4 m vent discharges.

(a) A 4 m venting system must discharge at least 4 m (approx. 13.1 ft) above the higher of—

(1) The weatherdeck; or

(2) Any walkway that is within 4 m (approx. 13.1 ft) of a line through the vent discharge and perpendicular to the deck.

(b) A 4 m venting system must discharge at least 10 m (approx. 32.8 ft) from air intakes for, or openings into, accommodation or service spaces.

§ 153.352 B/3 and 4 m venting system outlets.

A B/3 or 4 m venting system outlet must—

(a) Discharge vertically upwards; and

(b) Prevent precipitation from entering the vent system.

§ 153.353 High velocity vents.

The Commandant (G-MHM) approves on a case by case basis reductions in the 4 m or B/3 vent height requirements with the use of high velocity variable orifice vent outlets.

§ 153.354 Venting system inlet.

A venting system must terminate in the vapor space above the cargo when the tank is filled to a 2 percent ullage and the tankship has no heel or trim.

§ 153.355 PV venting systems.

When table I requires a PV venting system, the cargo tank must have a PV valve in its vent line. The PV valve must be located between the tank and any connection to another tank's vent line (such as a vent riser common to two or more tanks).

§ 153.358 Venting system flow capacity.

(a) The cross-sectional flow area of any vent system segment, including any PV or SR valve, must at no point be less than that of a pipe whose inside diameter is 6.4 cm (approx. 2.5 in.).

(b) When table I requires a closed or restricted gauging system, calculations must show that, under conditions in which a saturated cargo vapor is discharged through the venting system at the maximum anticipated loading rate, the pressure differential between the cargo tank vapor space and the atmosphere does not exceed 28 kPa gauge (approx. 4 psig), or, for independent tanks, the maximum working pressure of the tank.

§ 153.360 Venting system restriction.

A venting system must have no assembly that could reduce its cross-sectional flow area or flow capacity to less than that required in § 153.358.

§ 153.361 Arrangements for removal of valves from venting systems having multiple relief valves.

A venting system must have no arrangement that allows the easy removal of a valve (for repair, as an example) unless it—

(a) Has multiple relief valves;

(b) Has valves that are interlocked, so that a person cannot remove so many valves that the venting system no longer has the minimum relieving capacity required by § 153.358; and

(c) Does not allow cargo vapor to escape through the opening left after a valve has been removed.

§ 153.362 Venting system drain.

Unless a cargo vent system at every point is level or slopes back to the cargo tank under all conditions of heel and trim allowed under § 153.806, the cargo vent system must have a drain valve at each low point (trap) in the vent line.

§ 153.364 Venting system supports.

Supports for a vent system must meet § 38.10-10(c) of this chapter.

§ 153.366 Spill valves.

A spill valve—

(a) Must discharge into a container that has at least 0.6 m^3 (approx. 21.2 ft^3) capacity at any heel or trim allowed in the stability manual required by § 153.806; and

(b) Must meet subpart 162.017 of this chapter.

§ 153.368 Pressure-vacuum valves.

(a) The pressure side of a required pressure-vacuum relief valve must begin to open only at a pressure exceeding 3.5 kPa gauge (approx. 0.5 psig).

(b) A pressure-vacuum relief valve must meet the requirements of subpart 162.017 of this chapter.

§ 153.370 Minimum relief valve setting for ambient temperature cargo tanks.

The relief valve setting for a containment system that carries a cargo at ambient temperature must at least equal the cargo's vapor pressure at 46° C (approx. 115° F).

§ 153.371 Minimum relief valve setting for refrigerated cargo tanks.

The relief valve setting for a containment system that carries a refrigerated cargo must at least equal the lesser of—

(a) That in § 153.370; or

(b) 110 percent of the cargo's vapor pressure at the steady state temperature obtained by a full tank of cargo with the refrigeration system operating under ambient conditions described within the definition of a refrigerated tank in § 153.2.

§ 153.372 Gauges and vapor return for cargo vapor pressures exceeding 100 kPa (approx. 1 atmosphere).

por pressure exceeds 100 kPa absolute at ambient temperature a cargo whose vapor pressure exceeds 100 kPa absolute at 37.8° C (approx. 14.7 psia at 100° F) must have a—

(a) Tank pressure gauge at the point where cargo flow is controlled during transfer; and

(b) Vapor return connection.

CARGO GAUGING SYSTEMS

§ 153.400 General requirements for gauges.

(a) Columnar gauge glasses must not be installed on a cargo containment system.

(b) Flat sight glasses must meet § 38.10–20(h) of this chapter.

§ 153.404 Standards for containment systems having required closed gauges.

When table I requires a cargo's containment system to have a closed gauge, the containment system must have the following:

(a) A permanently installed closed gauging system.

(b) A vapor return connection.

(c) The high level alarm described in § 153.409.

(d) Either a closed cargo sampling system or a cargo sampling arrangement allowing the retrieval of a sample through an orifice not exceeding—

(1) 0.635 cm (approx. 0.25 in.) diameter when the cargo's vapor pressure is 28 kPa gauge (approx. 4 psig) or less; or

(2) 0.140 cm (approx. 0.055 in.) diameter when the cargo's vapor pressure exceeds 28 kPa (approx. 4 psig).

§ 153.406 Standards for containment systems having required restricted gauges.

When table I requires a cargo's containment system to have a restricted gauge, the containment system must have—

(a) A closed gauging system; or

(b) A system that has—

(1) A restricted gauge (e.g., a sounding tube) with an orifice diameter not exceeding 20 cm (approx. 7.8 in.);

(2) A permanently attached gauge cover that is vapor tight when in place; and

(3) A venting system that has either—

(i) Lock open PV valves; or

(ii) Valved bypasses around the PV valves.

§ 153.407 Special requirements for sounding tube gauges.

(a) A sounding tube installed as a restricted gauge must extend to within one meter (approx. 39.4 in.) of the bottom of the tank.

(b) A sounding tube must not be installed on a tank whose relief valve setting exceeds 28 kPa (approx. 4 psig) unless it is specifically permitted by the Commandant (G–MHM).

(c) A sounding tube must have no perforations in the tube wall.

§ 153.408 Tank overfill controls.

(a) When table I refers to this section, a cargo containment system must have—

(1) A cargo high level alarm system that meets § 153.409 and whose operation can be checked before each loading;

(2) A tank overfill control system that automatically closes the filling line before the tank is filled to 98 percent of its capacity; and

(3) A continuous tank cargo level indicator.

(b) The high level alarm system must be completely independent of the overfill control system.

(c) Each high level alarm must be marked as described in § 153.955 (c), (d), and (e) with the legend "TANK OVERFILL ALARM" so that the legend is visible from work areas in the part of the deck where the cargo containment systems are located.

§ 153.409 High level alarms.

When table I refers to this section or requires a cargo to have a closed gauging system, the cargo's containment system must have a high level alarm that—

(a) Gives an audible and visual signal before the cargo tank fills to 97 percent of its capacity; and

(b) Can be seen and heard where cargo transfer is controlled and on the open deck.

CARGO TEMPERATURE CONTROL SYSTEMS

§ 153.430 Heat transfer systems; general.

Each cargo cooling system required by this part and each cargo heating system must—

(a) Meet the standards of subchapters F (Marine Engineering) and J (Electrical Engineering) of this chapter;

(b) Have valving that enables the system to be isolated from all other cooling and heat transfer systems; and

(c) Allow manual regulation of the system's heat transfer rate.

§ 153.432 Cooling systems.

(a) Each cooling system required by this part must have an equivalent standby unit that is installed and that can be placed in operation immediately after an equipment failure.

(b) Each tankship that has a cargo tank with a required cooling system must have a manual that contains—

(1) A piping diagram for the cooling system; and

(2) Instructions for changing over to the standby system described in paragraph (a).

§ 153.434 Heat transfer coils within a tank.

A cargo cooling or heating system having coils within a tank must keep the heat transfer fluid at a pressure greater than that of the cargo.

§ 153.436 Heat transfer fluid.

A heat transfer fluid must have the approval of the Commandant (G–MHM) for use with each particular cargo.

§ 153.438 Cargo pressure or temperature alarms required.

(a) Each refrigerated tank must have—

(1) An alarm that operates when the cargo's pressure exceeds the vapor pressure described in § 153.371(b); or

(2) An alarm that operates when the cargo's temperature exceeds the steady state temperature described in § 153.371 (b).

(b) The alarm must give an audible and visual signal on the bridge and at the cargo control station.

(c) The cargo pressure or temperature alarm must be independent of other cargo pressure or temperature sensing arrangements.

§ 153.440 Cargo temperature sensors required.

(a) Each elevated temperature or refrigerated cargo tank must have a remote reading thermometer sensing the temperature within the cargo tank at the bottom of the tank.

(b) A refrigerated cargo tank must have a second thermometer at the top of the tank.

(c) A readout for each thermometer required by this section must be at the point where cargo transfer is controlled.

SPECIAL REQUIREMENTS FOR FLAMMABLE OR COMBUSTIBLE CARGOES

§ 153.460 Fire protection systems.

(a) With the exception of the vent riser, each part of a cargo containment system exposed on the weatherdeck must be covered by the fire protection system listed beside the cargo in table I and described in the footnotes to table I.

(b) The Commandant (G–MMT) approves the substitution of a dry chemical (D) type fire protection system for an A or B type on a case by case basis.

(c) A fire protection system required by this part must meet part 34 of this chapter or be specifically approved by the Commandant (G–MMT).

§ 153.461 Electrical bonding of independent tanks.

An independent metallic cargo tank that carries a flammable or combustible cargo must be electrically bonded to the tankship's hull.

§ 153.462 Static discharges from inert gas systems.

An inert gas system on a tank that carries a flammable or combustible cargo must not create static arcing as the inert gas is injected into the tank.

§ 153.463 Vent system discharges.

The discharge of a venting system must be at least 10 m (approx. 32.8 ft) from an ignition source if—

(a) The cargo tank is endorsed to carry a flammable or combustible cargo; and

(b) Table I requires the cargo to have a PV venting system.

§ 153.464 Fusible elements.

Each remotely actuated quick closing shutoff valve on a containment system that carries a flammable or combustible cargo must have a fusible element that melts at less than 104° C (approx. 220° F) and closes the valve.

§ 153.465 Flammable vapor detector.

(a) A tankship that carries a flammable cargo must have two vapor de-

tectors that meet § 35.20–15(b) of this chapter.

(b) At least one of the vapor detectors in paragraph (a) must be portable.

153.466 Electrical equipment.

A tankship carrying a flammable or combustible cargo under this part must meet subchapter J of this chapter.

§ 153.467 Ventilation systems for flammable cargoes.

Each ventilation system for a tankship endorsed to carry a flammable cargo must meet the following:

(a) Each electric motor that drives a ventilation fan must be outside ducts for any space that may contain flammable cargo vapor.

(b) Each ventilation impeller and its housing must meet one of the following:

(1) The impeller, housing, or both must be made of non-metallic material that does not generate static electricity.

(2) The impeller and housing must be made of non-ferrous material.

(3) The impeller and housing must be made of austenitic stainless steel.

(4) The tip clearance between the impeller and housing must be at least 1.3 cm (approx. 0.51 in.).

(c) No ventilation fan may have a combination of fixed and rotating components where one is made of an aluminum or magnesium alloy and the other made of a ferrous material.

SPECIAL REQUIREMENTS

§ 153.500 Inert gas systems.

When table I refers to this section, a cargo containment system must have a permanent inert gas system that:

(a) Maintains the vapor space of the containment system in an inert state by filling the vapor space with a gas that is neither reactive with the cargo nor flammable;

(b) Has a pressure control system that:

(1) Prevents the inert gas system from raising the cargo tank pressure to more than the relief valve setting; and

(2) Maintains at least a 3.5 kPa gauge (approx. 0.5 psig) pressure within the containment system at all times, including cargo discharge;

(c) Has storage for enough inerting gas to replace that normally lost while the tank's atmosphere is maintained in an inert condition (e.g. through tank breathing and relief valve leakage), but in no case an amount less than 5 percent of the tank's capacity when measured with the gas at −18°C (approx. 0°F) and a pressure equal to the cargo tank's relief valve setting; and

(d) Has connections for any supplemental gas supply necessary to maintain the inert gas pressure described in paragraph (b) during cargo discharge.

§ 153.501 Requirement for dry inert gas.

When table I refers to this section, an inert gas system for the containment system must supply inert gas containing no more than 100 ppm water.

§ 153.515 Special requirements for extremely flammable cargoes.

When table I refers to this section:

(a) An enclosed space containing a cargo tank must have an inerting system that meets the requirements in § 153.500 applying to the inert gas system of a containment system;

(b) Cargo discharge pumps must be of a type that does not subject the shaft gland to the cargo under pressure or that is submerged; and

(c) The cargo tank's relief valve setting must be no less than 21 kPa gauge (approx. 3 psig).

§ 153.520 Special requirements for carbon disulfide.

A containment system carrying carbon disulfide must meet the following:

(a) Each cargo pump must be of the intank type and encased within a cylindrical well that extends from the top of the tank to a point no more than 10 cm (approx. 4 in.) above the bottom of the tank.

(b) Within that part of the tankship where the use of electrical equipment is restricted by § 111.85–10 of this chapter, a tankship must have no:

(1) Electrical equipment; or

(2) Equipment that may exceed a temperature of 80°C (approx. 175°F).

(c) The cargo piping and venting systems must be completely independent of those for other cargo.

(d) Pressure relief valves must be made of type 304 or 316 stainless steel.

§ 153.525 Special requirements for unusually toxic cargoes.

When table I refers to this section a containment system must meet the following:

(a) The cargo piping system must be designed so that it can be isolated from any containment system endorsed for a cargo not covered by this section.

(b) A cargo tank's relief valve setting must be not less than 21 kPa gauge (approx. 3 psig).

(c) All cargo pumps and valves located below the weatherdeck must be operable from the weatherdeck.

(d) A heat transfer system for the cargo must not enter the engine room and must be:

(1) Independent of any other system;

(2) Totally external to the cargo containment system; or

(3) Approved by the Commandant (G–MHM) for use with toxic cargoes.

(e) The cargo must be separated from any bunkers by at least two bulkheads.

(f) A cargo tank's venting system must have a vapor return connection.

§ 153.526 Toxic vapor detectors.

When table I refers to this section, a tankship must have two toxic vapor detectors, at least one of which must be portable, each able to measure the time weighted average (TWA) vapor concentration of the cargo. These vapor detectors may be combined with those required by § 153.465.

§ 153.527 Toxic vapor protection.

When table I refers to this section, a tankship must have on board for each crewmember a pressure demand respiratory protective device approved by the Mining Enforcement and Safety Administration and the National Institute for Occupational Safety and Health, or the tankship's flag administration, as an escape only device.

§ 153.530 Special requirements for alkylene oxides.

When table I refers to this section, a containment system must meet the following:

(a) Except as provided in paragraphs (b) and (c), a cargo containment system must be made of:

(1) Stainless steel other than types 416 and 442; and

(2) Steel.

(b) Except as provided in paragraph (c), gaskets must be composites of spirally wound stainless steel and Teflon or similar fluorinated polymer.

(c) The Commandant (G–MHM) approves a cargo containment system using materials other than those described in this section for alkylene oxides on a case by case basis if:

(1) The person wishing to have the containment system approved completes any tests prescribed by the Commandant (G–MHM); and

(2) The Commandant (G–MHM) approves the results of the tests and the material for use with alkylene oxides.

(d) The following materials are generally found unsatisfactory for gaskets, packing, insulation, and similar uses in alkylene oxide containment systems and would require extensive testing as described in paragraph (c) before being approved:

(1) Neoprene or natural rubber if it might be in contact with the alkylene oxide.

(2) Asbestos or asbestos mixed with other materials such as with many common insulations, packing materials, and gasket materials.

(3) Materials containing oxides of magnesium, such as mineral wools.

(e) The tank's relief valve setting must not be less than 21 kPa guage (approx. 3 psig).

(f) A containment system must have a cooling system. The cooling system:

(1) Must not compress the cargo;

(2) Must regulate the cargo temperature automatically and allow manual regulation; and

(3) Must maintain the cargo temperature below 40°C (approx. 104°F).

(g) The cargo piping system must:

(1) Comply with part 38 of this chapter;

(2) Be completely separate from all other systems;

(3) Be assembled from valves, fittings, and accessories having a pressure rating of not less than 1030 kPa guage (approx. 150 psig) (American National Standards Institute); and

(4) Have no threaded joints.

(h) The cargo containment system must have an arrangement for sampling the vapor space above the cargo as described in § 153.1010(c).

(i) Valve disks or disk faces, seats, and other wearing valve parts must be made of stainless steel containing no less than 11 percent chromium.

(j) The venting system must be entirely separate from other containment or tankship systems.

(k) When a cargo tank is in an enclosed space, the space must have:

(1) An inert gas system meeting the requirements that apply to the inert gas system of a containment system in § 153.500, or

(2) A forced ventilation system meeting the requirements that apply to a cargo handling space ventilation system in § 153.312.

(l) Cofferdams, cargo tanks, double bottom spaces, and other enclosed spaces adjacent to an integral cargo tank must have an inert gas system meeting the requirements that apply to the inert gas system of a containment system in § 153.500.

(m) An intank pump or inert gas displacement must be used to discharge cargo.

(n) The cargo piping system's hose connection must have a remotely actuated quick closing shutoff valve.

(o) Cargo hose must: (1) Have the specific approval of the Commandant (G–MMT) for use in alkylene oxide transfer; and

(2) Be marked "For Alkylene Oxide Transfer Only".

(p) All exposed parts of the cargo containment system above or on the deck, such as tank domes, cargo piping, and loading manifolds, must be covered by a water spray system that:

(1) Operates automatically in a fire involving the cargo containment system;

(2) Has at least two remote manual actuators, one in each emergency shutdown station required by § 153.296; and

(3) Covers the area of application with a uniform spray of

$$0.175 \frac{l}{m^2 \text{ sec}} \left(0.0043 \frac{\text{gal}}{\text{ft}^2 \text{ sec}} \right).$$

§ 153.545 Special requirements for liquid sulfur.

(a) A containment system carrying liquid sulfur must have:

(1) A cargo tank ventilation system that:

(i) Maintains the H_2S vapor concentration below 1.85 percent by volume; and

(ii) Prevents sulfur buildup within itself; and

(2) An alarm system designed to operate when the ventilation system blower fails.

(b) The void spaces around a cargo tank that carries liquid sulfur must be oil tight.

(c) A cargo tank that carries liquid sulfur and the void spaces surrounding the tank must have connections for sampling vapor.

§ 153.554 Special requirements for acids.

When table I refers to this section:

(a) Each containment system loading and discharge connection must have a spray shield;

(b) Each cargo containment system must be separated from bunkers by double walls, such as a cofferdam and piping tunnels; and

(c) Each vessel must have on board a means to determine whether cargo has leaked into the spaces adjacent to a cargo containment system.

§ 153.555 Special requirements for inorganic acids.

When table I refers to this section:

(a) A tankship's shell plating must not be a part of the cargo tank; and

(b) An enclosed compartment containing, or a compartment adjacent to, a cargo tank must have no electrical equipment.

§ 153.556 Special requirements for sulfuric acid and oleum.

(a) Except as prescribed in paragraphs (b) and (c) of this section, containment systems carrying sulfuric acid, oleum, or contaminated sulfuric acid are approved by the Commandant (G–MHM) on a case by case basis.

(b) A containment system carrying sulfuric acid may be:

(1) Made of unlined steel if the cargo composition is between 70 and 80 or between 90 and 100 percent acid by weight;

(2) Lined with lead if the cargo composition does not exceed 96 percent acid by weight; or

(3) Lined with natural rubber or neoprene if the cargo composition does not exceed 51 percent acid by weight.

(c) A containment system for oleum may be of unlined steel if the concentration of free sulfur trioxide in the oleum exceeds 20 percent by weight.

§ 153.557 Special requirements for hydrochloric acid.

(a) A containment system that carries hydrochloric acid must be lined with:

(1) Natural rubber;

(2) Neoprene; or

(3) A material approved for hydrochloric acid tanks by the Commandant (G–MHM).

(b) Containment systems for contaminated hydrochloric acid are approved by the Commandant (G–MHM) on a case by case basis.

§ 153.558 Special requirements for phosphoric acid.

A phosphoric acid containment system must be:

(a) Lined with natural rubber or neoprene;

(b) Lined with a material approved for phosphoric acid tanks by the Commandant (G–MHM); or

(c) Made of a stainless steel that resists corrosion by phosphoric acid.

§ 153.559 Special requirements for nitric acid (less than 70 percent).

A containment system that carries nitric acid (less than 70 percent) must be of stainless steel that resists corrosion by nitric acid.

§ 153.600 Special requirements for nitropropane.

Nitropropane must not be carried in a deck tank.

TESTING AND INSPECTION

§ 153.806 Stability test and information.

(a) Each tankship must meet part 93 of this chapter.

(b) Each tankship must have a manual containing:

(1) Information that enables the master to load and ballast the tankship while keeping structural stresses within design limits;

(2) Damage stability information including, but not limited to, all loading restrictions necessary to ensure that the tankship meets the requirements for its hull type; and

(3) Trim information.

§ 153.808 Examination required for a Letter of Compliance.

Before the Commandant (G–MHM) issues a Letter of Compliance to a vessel, the vessel must call at a U.S. port for an examination by the Coast Guard, following the procedures under § 153.809.

§ 153.809 Procedures for having the Coast Guard examine a vessel for a Letter of Compliance.

To have the Coast Guard examine his vessel for a Letter of Compliance, the owner of a vessel must proceed as follows:

(a) After making application pursuant to § 153.9, await notification by the Commandant (G–MHM) that review of the vessel's plans or IMCO Certificate is complete.

(b) After notification that review is complete, request the Commandant (G–MHM) to arrange an examination by the Coast Guard, stating:

(1) The expected date of the vessel's arrival in U.S. waters;

(2) The port of call where the vessel is to be inspected;

(3) The vessel's agent in the port of call; and

(4) Any cargoes the vessel is to carry under § 153.811.

(c) If the vessel is to carry a cargo under § 153.811, allow at least 14 calendar days from the time the Commandant (G–MHM) receives the request for an examination before bringing the vessel into U.S. waters.

(d) If the vessel is not to carry a cargo under § 153.811, allow at least 14 calendar days from the time the Commandant (G–MHM) receives the request for an examination until the date of the vessel's examination.

§ 153.810 Fourteen day notice required for a Letter of Compliance examination.

Unless the Commandant (G–MHM) agrees to examine a specific tankship on shorter notice, the Commandant (G–MHM) does not examine a tankship for a Letter of Compliance sooner than 14

calendar days from the time the Commandant (G-MHM) receives the owner's request under § 153.809(b).

§ 153.811 Carrying cargo into U.S. waters on the voyage for a Letter of Compliance examination.

If entering U.S. waters for examination under §§ 153.808 and 153.809, a vessel that has never received a Letter of Compliance or whose Letter of Compliance has expired may only carry a cargo described in § 153.5 if specifically authorized to do so by the Commandant (G-MHM).

§ 153.812 Inspection for Certificate of Inspection.

The rules governing the issuance of Certificates of Inspection are contained in part 31 of this chapter.

Subpart C—Operations

Documents and Cargo Information

§ 153.900 Certificates, letters, endorsements required.

(a) Each U.S. flag tankship [6] must have its Certificate of Inspection issued under Subchapter D (Tank Vessels) of this chapter endorsed under this part with the name of each cargo in table I that it carries or must have written authorization under § 153.5(b) from the Commandant (G-MHM).

(b) Each foreign flag tankship [6] whose flag administration issues the IMCO Certificate must have—

(1) an IMCO Certificate issued by the flag administration and a Letter of Compliance issued and endorsed under this part with the name of the cargo; or

(2) prior written authorization under § 153.5(b) or § 153.808 from the Commandant (G-MHM).

(c) Each foreign flag tankship [6] whose flag administration does not issue the IMCO Certificate must have—

(1) a Letter of Compliance issued and endorsed under this part with the name of the cargo; or

(2) written authorization under § 153.5(b) or § 153.808 from the Commandant (G-MHM).

§ 153.901 Certificates or letters required to be on bridge.

No person may operate a tankship unless the endorsed Certificate of Inspection, Letter of Compliance, or written authorization required by § 153.900 is posted on the bridge of the tankship.

§ 153.902 Expiration of Letters of Compliance.

A Letter of Compliance is valid for a period not exceeding two years after the date of examination under § 153.808. The Coast Guard enters the expiration date on the Letter of Compliance.

§ 153.904 Limitations in the endorsement.

No person may operate a tankship unless he complies with all limitations in the endorsement on the tankship's Certificate of Inspection or Letter of Compliance.

§ 153.905 Regulations required to be on board.

No person may operate a tankship unless a copy of this part and parts 34 and 35 of this chapter, containing all amendments up to the date of the endorsement of the tankship's Certificate of Inspection or Letter of Compliance are on board.

§ 153.907 Cargo information cards.

(a) No person may operate a tankship unless a cargo information card for each cargo being transported that is listed in table I is carried either on the bridge, in the ship's office, or in another location easily accessible to the person in charge of the watch.

(b) Each cargo information card must be at least 17 cm x 24 cm (approx. 6.7 in. x 9.4 in.), have printing on one side only, and contain the following information about the cargo:

(1) The name of the cargo, as listed in Table I.

(2) A description of the appearance of the cargo.

(3) A description of the odor of the cargo.

(4) The hazards involved in handling the cargo.

(5) Instructions for safe handling of the cargo including any special procedures such as inerting.

(6) The procedures to be followed in the event of cargo spills, leaks, uncontrolled release, human exposure to the cargo, or cargo handling equipment breakdown.

(7) A list of fire fighting procedures and extinguishing agents effective with cargo fires.

§ 153.908 Shipping document.

No person may operate a tankship without a shipping document, such as a manifest, on the bridge of the tankship completed by the shipper, the tankship's master, the shipowner, or the tankship's agent that lists for each cargo on board—

(a) The tank in which the cargo is stowed;

(b) The name of the shipper;

(c) The location of the loading terminal;

(d) The cargo name listed in table I or § 30.25-1 of this chapter, or the shipper's name for the cargo if it is not listed; and

(e) The quantity of the cargo.

§ 153.909 Cargo location plan.

(a) No person may operate a tankship unless a cargo location plan is kept with the set of cargo information cards required by § 153.907.

(b) The cargo location plan must show the location and number of each cargo tank and the name of the cargo in each tank.

(c) Names of dangerous cargoes on the plan must not differ from those listed in table I or § 30.25-1 of this chapter.

§ 153.910 Cargo piping plan.

No person may operate a tankship unless the tankship has a cargo piping plan that—

(a) Shows all cargo piping on the tankship;

(b) Shows all cargo valving, pumps, and other equipment that is used during cargo transfer;

(c) Shows the cargo tanks;

(d) Shows any modifications necessary to a containment system that is to be isolated under § 153.963 or §§ 153.525 and 153.1020; and

(e) Emphasizes the piping and equipment described in paragraphs (a), (b), and (d) of this section by using contrasting colors, line widths, or similar methods.

§ 153.912 Certificate of inhibition or stabilization.

(a) When a cargo in table I is referred to this section, no person may operate a tankship carrying the cargo without a written certification, carried on the bridge of the tankship, from the shipper that the cargo is—

(1) Inhibited; or

(2) Stabilized.

(b) The certification required by this section must contain the following information:

(1) Whether the cargo is inhibited or stabilized.

(2) The name and concentration of the inhibitor or stabilizer.

(3) The date the inhibitor or stabilizer was added.

(4) The length of time the inhibitor or stabilizer is effective.

(5) Any temperature limitations qualifying the inhibitor's or stabilizer's effective lifetime.

(6) The action to be taken should be duration of the voyage exceed the inhibitor's or stabilizer's useful life.

§ 153.914 Documents at the transfer terminal.

While a tankship is moored at a transfer terminal, the master shall ensure that the terminal has, in addition to the copies the tankship must have—

(a) A copy of the shipping document prescribed in § 153.908; and

(b) A set of the information cards prescribed in § 153.907.

General Cargo Operational Requirements

§ 153.920 Cargo quantity limitations.

(a) No person may load a cargo tank or operate a tankship that carries a cargo tank containing in excess of 1250 m^3 (approx. 44,138 ft^3) of cargo requiring a type I containment system.

(b) No person may load a cargo tank or operate a tankship that carries a cargo tank containing in excess of 3000 m^3 (approx. 105,932 ft^3) of a cargo requiring a type II containment system.

[6] The definition of "tankship" excludes those vessels whose tanks are clean and gas free.

§ 153.921 Explosives.

No person may load, off-load, or carry a cargo listed in this part on board a vessel that carries explosives unless he has the prior written permission of the Commandant (G-MHM).

§ 153.923 Inerting systems.

The master shall ensure that the inert gas systems for any cargo that this part requires to be inerted are operating correctly.

GENERAL VESSEL SAFETY

§ 153.930 Cargo antidotes.

No person may operate a tankship that carries a cargo listed in Table I unless the tankship has on board the antidotes described for the cargo in the *Medical First Aid Guide for Use in Accidents Involving Dangerous Goods*, published by IMCO.

§ 153.931 Obstruction of pumproom ladderways.

The master shall ensure that all cargo pumproom ladderways are unobstructed at all times.

§ 153.932 Goggles and protective clothing.

(a) The master shall ensure that each person wear a face mask or tight-fitting goggles for eye protection against splashing or spraying liquids if that person is—

(1) Sampling cargo;

(2) Transferring cargo;

(3) Making or breaking a cargo hose connection;

(4) Gauging a cargo tank; or

(5) Opening a cargo tank by opening a Butterworth hatch, ullage hatch, cargo tank hatch, or similar opening.

(b) The master shall ensure that each person wear a face mask or tight-fitting goggles for eye protection against splashing or spraying liquids if the person is—

(1) In the area of the deck where the cargo tanks, cargo piping, and cargo pumprooms are located while a cargo transfer is taking place; or

(2) In a cargo pumproom, void space adjacent to a cargo tank, or a space containing part of a cargo containment system.

(c) The master shall ensure that each person in paragraphs (a) and (b) wear any additional protective clothing the master believes necessary to protect the person from the cargo's hazards.

§ 153.933 Protective clothing required.

When table I refers to this section, the master shall ensure that every person forward of the accommodation deckhouse who is involved in cargo sampling, gauging, or making or breaking cargo connections wears coveralls or a large apron, boots, gloves, and tight-fitting goggles.

§ 153.934 Entry into spaces containing cargo vapor.

(a) No person may enter a cargo tank, cargo handling space, or void space in that part of the tankship where the cargo tanks are located without the permission of the master.

(b) Before permitting anyone to enter a cargo tank, cargo handling space, or void space, the master shall ensure that—

(1) The space is free of toxic vapors and has sufficient oxygen to support life; or

(2) Those entering the space wear protective equipment with self-contained breathing apparatus as described in § 153.214(b) and an officer closely supervises the entire operation.

§ 153.935 Opening of tanks and cargo sampling.

(a) Except as provided in paragraph (b) of this section, the master shall ensure that all cargo tank hatches, ullage openings, and tank cleaning openings are tightly closed at all times.

(b) The master may not authorize the opening of a cargo tank, except—

(1) To clean a tank;

(2) To transfer a cargo that table I allows in a containment system having an open gauging system;

(3) To sample a cargo that table I allows in a containment system having an open gauging system; or

(4) To sample a cargo that table I allows in a containment system having a restricted gauging system if—

(i) The tank is not being filled during sampling;

(ii) The vent system has relieved any pressure in the tank;

(iii) The person sampling the cargo wears the protective clothing required during cargo transfer; and

(iv) The tank is closed tightly following sampling.

(c) The master shall ensure that cargoes requiring closed gauging are sampled only through the controlled sampling arrangement required by § 153.404 (b).

§ 153.936 Illness, alcohol, drugs.

The master shall ensure that no person participates in cargo related operations who appears to be intoxicated by alcohol or drugs or to be so ill as to be unfit for the particular operation.

MARKING OF CARGO TRANSFER HOSE

§ 153.940 Standards for marking of cargo hose.

No person may mark a hose assembly as meeting the standards of this section unless the hose assembly meets the following requirements:

(a) Each hose assembly must have—

(1) Fully threaded connections;

(2) Flanges that meet standard B16.5, *Steel Pipe Flanges and Flange Fittings*, or standard B16.31, *Nonferrous Pipe Flanges*, of the American National Standards Institute; or

(3) Quick-connect couplings that are acceptable to the Commandant (G-MMT).

(b) Each hose assembly must be marked with the—

(1) Date of manufacture;

(2) Working pressure described in paragraph (d);

(3) Date of the last test required by paragraph (e) of this section; and

(4) Manufacturer's recommended maximum and minimum temperatures.

(c) A cargo hose assembly must have a minimum bursting pressure as stated by the manufacturer of at least 5152 kPa gauge (approx. 750 psig).

(d) The working pressure marked on a hose must meet the following:

(1) Be at least 1030 kPa gauge (approx. 150 psig).

(2) Not exceed 20 per cent (one-fifth) of the manufacturer's stated bursting pressure.

(3) Not exceed the manufacturer's recommended working pressure.

(4) Not exceed the test pressure used in the latest test under paragraph (e) (3).

(e) A cargo hose assembly must be inspected and tested by placing it in a straight, horizontal position so that its entire external surface is accessible. It must be ascertained that the hose assembly—

(1) Has no loose covers, kinks, bulges, soft spots, and no gouges, cuts, or slashes that penetrate any hose reinforcement;

(2) Has no external and, to the extent internal inspection is possible with both ends of the hose open, no internal deterioration; and

(3) Does not burst, bulge, leak, or abnormally distort under static liquid pressure at least as great as the recommended working pressure.

CARGO TRANSFER PROCEDURES

§ 153.953 Signals during cargo transfer.

The master shall ensure that—

(a) The tankship displays a red flag in the day and a red light at night when transferring cargo while fast to a dock;

(b) The tankship displays a red flag when transferring cargo while at anchor; and

(c) The red flag or the red light is visible from all sides of the tankship.

§ 153.955 Warning signs during cargo transfer.

(a) When transferring cargo while fast to a dock or at anchor in port, the master shall ensure that the tankship displays a warning sign at the gangway facing the shore so that it may be seen from the shore and another warning sign facing outboard towards the water so that it may be seen from the water. (See figure 1.)

(b) Except as provided in paragraph (f) of this section, each warning sign must have the following legends:

(1) Warning.

(2) Dangerous Cargo.

(3) No Visitors.

(4) No Smoking.

(5) No Open Lights.

(c) Each letter must be block style, black on a white background.

(d) Each letter must—

(1) Be 7.5 cm (approx. 3 in.) high;

(2) Be 5 cm (approx. 2 in.) wide except for "M" and "W" which must be 7.5 cm (approx. 3 in.) wide and the letter "I" which may be 1.3 cm (approx. ½ in.) wide; and

Figure 1 - Minimum Dimensions for Warning Sign

(3) Have 1.3 cm (approx. ½ in.) stroke width.

(e) The spacing must be—

(1) 1.3 cm (approx. ½ in.) between letters of the same word;

(2) 5 cm (approx. 2 in.) between words;

(3) 5 cm (approx. 2 in.) between lines; and

(4) 5 cm (approx. 2 in.) at the borders of the sign.

(f) Except as described in § 153.1045, the legends "No Smoking" and "No Open Lights" are not required when the cargoes on board the tankship are neither flammable nor combustible.

§ 153.957 Person in charge of cargo transfer.

(a) The master of a U.S. flag tankship shall ensure that cargo transfer operations are supervised by a person designated as a person in charge of cargo transfer under 33 CFR 155.710.

(b) No person may serve, and no one may use the services of a person as a person in charge of cargo transfer on a foreign flag tankship unless the person—

(1) Holds a valid document issued by the flag administration authorizing service as a person in charge of cargo transfer aboard the vessel that is transferring cargo;

(2) Is designated by the master;

(3) Is readily able to communicate in English with the person in charge of cargo transfer at the transfer facility either directly or through an interpreter who is available to him during the transfer; and

(4) Has studied and understands his responsibilities as described in this subchapter.

§ 153.959 Approval to begin transfer operations required.

No person may make connections for cargo transfer or transfer cargo unless he has authorization from the person in charge of cargo transfer.

§ 153.963 Incompatible cargo.

(a) The person in charge of cargo transfer may not authorize the loading of incompatible [7] cargoes into cargo containment systems unless the cargoes are separated by double walls or double bulkheads, such as—

(1) Cofferdams;

(2) Empty tanks;

(3) Tanks containing mutually compatible cargo; and

(4) Piping tunnels.

(b) The person in charge of cargo transfer may not authorize loading of incompatible cargoes into cargo containment systems that have common piping or venting systems.

§ 153.964 Discharge by gas pressurization.

The person in charge of cargo transfer may not authorize cargo discharge by gas pressurization unless—

(a) The tank to be offloaded has an SR or PV venting system;

(b) The pressurization medium is either the cargo vapor or a nonflammable, nontoxic gas inert to the cargo; and

(c) The pressurizing line has—

(1) A pressure reducing valve whose setting does not exceed 90% of the tank's relief valve setting and a manual control valve between the pressure reducing valve and the tank; or

(2) For an inert gas medium—

(i) A safety relief valve with a cross sectional flow area at least equal to that of the pressurizing line and whose relieving pressure does not exceed 90 percent of the tank's relief valve setting;

(ii) A manual control valve between the safety relief valve and the tank; and

(iii) A check valve between the manual control valve and the tank.

§ 153.966 Discharge by liquid displacement.

The person in charge of cargo transfer may not authorize cargo discharge by liquid displacement unless the liquid supply line to the tank has—

(a) a safety relief or pressure reducing valve set to operate at no more than 80 percent of the tank's relief valve setting; and

(b) a manual control valve between the tank and the supply line's safety relief valve or pressure reducing value.

§ 153.968 Cargo transfer conference.

(a) Before he may begin making connections for cargo transfer, the person in charge of cargo transfer shall confer with the person supervising the cargo transfer at the facility.

(b) The person in charge of cargo transfer shall discuss the important aspects of the transfer operation, such as the following, with the supervisor at the facility:

(1) The products to be transferred.

(2) The transfer rates.

(3) The critical or hazardous stages of the transfer operation.

(4) The emergency procedures in case of a spill.

§ 153.970 Cargo transfer piping.

The person in charge of cargo transfer shall ensure that—

(a) Cargo is transferred to or from a cargo tank only through the tankship's cargo piping system;

(b) Vapor not returned to shore through the tankship's vapor return system is discharged at the height required for the cargo's vent riser in table I, and

(c) All cargo vapor is returned to shore through the valved connection on the venting system if—

(1) The cargo requires closed gauging, is referenced to § 153.372 or is referenced to § 153.525;

(2) The transfer terminal has vapor return equipment; and

(3) In his estimation the vapor return equipment is adequate to handle the vapor expected from the tank.

§ 153.972 Connecting a cargo hose.

The person in charge of cargo transfer may not authorize the connection of a hose to a cargo containment system unless—

(a) He has ensured himself that the cargo will not weaken or damage the hose;

(b) The hose is marked as meeting the standards of § 153.940;

(c) The date of the hose's last pressure test is within one year of the date on which the hose is used to transfer cargo;

(d) The recommended working pressure marked on a hose used for discharge meets or exceeds the working pressure marked on the cargo piping at the hose connection; and

(e) The cargo's temperature is within the manufacturer's recommended maximum and minimum hose temperatures.

§ 153.975 Preparation for cargo transfer.

The person in charge of cargo transfer may not approve or continue cargo transfer unless the following conditions are met:

(a) No fires or open flames are on deck or in compartments near the hose connections when table I requires the cargo's containment system to have a fire protection system.

(b) Any electrical bonding of the tankship to the transfer facility is made before the cargo transfer piping is joined.

(c) Any supplemental inert gas supply necessary to maintain the 3.5 kPa gauge (approx. 0.5 psig) pressure in the tank during offloading (see § 153.500) is connected to the inert gas pressure control system.

[7] Incompatible cargoes are described in NVC 4-75, available from the Commandant (G-MHM-3/83). Tel. no. (202) 426-1577.

(d) The transfer connections have enough slack to allow for vessel movement.

(e) The transfer connections are supported by tackles.

(f) The cargo high level alarms are functioning correctly when cargo is loaded.

(g) Joints and couplings are gasketed and mated tightly.

(h) Flanges are bolted tightly.

(i) No repair work is underway in areas where cargo or cargo vapors may collect.

(j) Cargo and sea valves are properly set, with those sea valves connected to cargo piping lashed or sealed shut.

(k) Venting system bypass valves are set for cargo transfer and are operating properly.

(l) All scuppers are plugged.

(m) Smoking is limited to safe places.

(n) Fire fighting and safety equipment is ready.

(o) He is in effective communication with the transfer terminal.

(p) The person in charge of the transfer terminal has acknowledged that he is ready to transfer.

(q) Pressures within the cargo transfer and containment systems do not exceed the pressure ranges for which the transfer hose and containment systems are designed.

(r) No vessels that would hazard cargo transfer are alongside the tankship.

§ 153.976 Transfer of packaged cargo or ship's stores.

The person in charge of cargo transfer may neither begin nor continue the transfer of a flammable or combustible cargo while packaged cargo or ship's stores are transferred unless transfer of the packaged cargo or ship's stores does not hazard transfer of the flammable or combustible cargo.

§ 153.977 Supervision of cargo transfer.

The person in charge of cargo transfer shall—

(a) Supervise the operation of cargo system valves; and

(b) Monitor the cargo loading rate to avoid overfilling cargo tanks.

§ 153.979 Gauging with a sounding tube.

(a) No person may remove the cover of a sounding tube unless he has authorization from the person in charge of cargo transfer.

(b) The person in charge of cargo transfer may not authorize removal of the cover from a sounding tube gauge unless all tank pressure has been relieved through the tank's venting system.

§ 153.981 Leaving room in tank for cargo expansion.

The person in charge of cargo transfer shall ensure that the amount of cargo in a tank does not exceed the tank's capacity at any ambient temperature between −18° C (approx. 0° F) and 46° C (approx. 115° F).

§ 153.983 Termination procedures.

Upon completion of the transfer operation, the person in charge of cargo transfer shall ensure that—

(a) The cargo transfer connections are closed off;

(b) The transfer lines and hoses are drained of cargo, either into the tank or back to the transfer terminal;

(c) Any electrical bonding between the vessel and the shore facility is broken only after the cargo hose is disconnected and all spills removed; and

(d) Each vent system is returned to its nonloading configuration.

SPECIAL CARGO PROCEDURES

§ 153.1000 Special operating requirements for cargoes reactive with water.

When table I refers to this section, the master must ensure that the cargo—

(a) Is carried only in a containment system completely isolated from any systems containing water, such as slop tanks, ballast tanks, cargo tanks containing slops or ballast, their vent lines or piping; and

(b) Is separated by double walls, such as cofferdams and piping tunnels, from any system containing water, as for example those described in paragraph (a) of this section.

§ 153.1010 Alkylene oxides.

(a) Before he loads a cargo containment system with a cargo referenced to this section in table I, the person in charge of cargo transfer shall do the following:

(1) Inspect the cargo tank to be sure it does not have heavy rust accumulations on its walls or bottom.

(2) Purge the containment system until the oxygen content of the cargo tank is less than 2% by volume.

(b) The person in charge of an alkylene oxide cargo transfer shall ensure that—

(1) No alkylene oxide vapor or liquid is released to the atmosphere during cargo transfer;

(2) No vapor return system connected to an alkylene oxide containment system is at the same time connected to another containment system;

(3) Alkylene oxide is discharged only by an intank cargo pump or inert gas displacement;

(4) Transfer hose is approved by the Commandant (G-MMT) under § 153.530 (o) for alkylene oxide transfer and is marked "For Alkylene Oxide Transfer Only"; and

(5) A water hose is laid out on deck with water pressure to the nozzle, and all alkylene oxide spillages are washed away immediately.

(c) After loading alkylene oxides, the person in charge of cargo transfer shall check the composition of the vapor space above the alkylene oxide and purge the space with inert gas until the oxygen content is below 2% by volume.

§ 153.1011 Use of alkylene oxide containment systems and hoses with other products.

(a) An alkylene oxide may not be carried in a containment system that, within the previous five loadings, has carried a cargo in paragraph (d) unless the containment system has been cleaned to the satisfaction of a Coast Guard Marine Inspector or a person specifically authorized by the Commandant (G-MHM) to approve oxide tank cleaning.

(b) No other cargo may be loaded into a containment system which has carried an alkylene oxide unless the containment system has been cleaned of alkylene oxide to the satisfaction of a Coast Guard Marine Inspector or a person specifically authorized by the Commandant (G-MHM) to approve oxide tank cleaning.

(c) No person may use a hose marked "For Alkylene Oxide Transfer Only" for the transfer of a cargo other than an alkylene oxide.

(d) The following cargoes are particularly reactive with alkylene oxides:

(1) Ammonia.
(2) Ammonia solutions.
(3) Amines.
(4) Alcoholamines.
(5) Inorganic acids.
(6) Organic acids.
(7) Phenolic compounds.
(8) Monomers.
(9) Compounds containing a halogen.
(10) Compounds containing sulfur except sulfates or sulfonates yielding a solution having a pH between 7.5 and 6.5 when mixed with water in all proportions.
(11) Caustic soda and caustic potash.

§ 153.1020 Unusually toxic cargoes.

(a) No person may load or carry a cargo referenced to this section in table I unless the cargo's piping system is isolated from piping systems carrying cargoes not referred to this section as shown in the piping plan required by § 153.910.

(b) The master shall ensure that no heat transfer medium that has been circulated through a cargo referenced to this section in table I is circulated through a cargo not referenced to this section unless he determines the medium to be uncontaminated with cargo.

(c) No person may discharge overboard condensed steam from the heating system of a cargo referenced to this section in table I unless he first determines the condensate to be uncontaminated with cargo.

§ 153.1025 Motor fuel antiknock compounds.

(a) No person may load or carry any other cargo in a containment system approved for motor fuel antiknock compounds containing lead alkyls except a cargo to be used solely in the manufacture of motor fuel antiknock compounds.

(b) The master shall ensure that no person enter a pumproom or void space

that contains piping from a containment system approved for motor fuel antiknock compounds containing lead alkyls unless—

(1) The pumproom or void space atmosphere has been analyzed for its lead content and found to be less than 0.15 mg/m³; or

(2) The person follows the procedures for entering a cargo tank described in paragraph (c).

(c) No person may enter a cargo tank endorsed for motor fuel antiknock compounds containing lead alkyls without prior specific authorization from the Commandant (G–MHM). This authorization may be obtained by telephone ((202) 426–1217) if the person has previously obtained approval for the cargo tank entry procedure from the Commandant (G–MHM).

(d) No person may enter a cargo tank endorsed for motor fuel anti-knock compounds if he does not follow the conditions in the authorization under paragraph (c).

§ 153.1035 Stabilization of acetone cyanohydrin.

No person may operate a tankship having on board acetone cyanohydrin unless the acetone cyanohydrin is stabilized with an inorganic acid.

§ 153.1040 Carbon disulfide.

(a) No person may load, carry, or discharge carbon disulfide unless the cargo tank has a water pad over the cargo of at least one meter (approx. 40 in.).

(b) The person in charge of a carbon disulfide transfer operation shall ensure that carbon disulfide is discharged only by displacement or intank cargo pump.

(c) No person may remove a cargo pump for a containment system that carries carbon disulfide unless—

(1) The containment system has a gas free certificate issued under the standards in § 35.01–1 of this chapter; or

(2) The vapor space in the pump well is filled with water.

§ 153.1045 Inorganic acids.

When table I refers to this section, the person in charge of cargo transfer shall ensure that the legends "NO SMOKING" and "NO OPEN LIGHTS" are displayed on the warning sign required in § 153.955(a) when cargo is transferred.

§ 153.1046 Sulfuric acid.

No person may liquefy frozen or congealed sulfuric acid other than by external tank heating coils.

§ 153.1052 Carriage of other cargoes in acid tanks.

Other cargo must not be carried in a cargo containment system endorsed to carry sulfuric acid, hydrochloric acid, or phosphoric acid without specific authorization from the Commandant (G–MHM).

§ 153.1055 Nitropropane.

(a) No person may load or carry 1- or 2-nitropropane in a tank having heating coils unless the heating coils have been isolated from their heat source by completely disconnecting them, for example, by inserting a blanking plate or by removing a spool piece in a steam supply line.

(b) No person may load or carry 1- or 2-nitropropane in a tank located in a hold, or adjacent to a cargo, whose temperature exceeds 50° C (approx. 122° F).

MAINTENANCE

§ 153.1500 Venting system rupture disks.

The master shall ensure that a relief valve exposed to a cargo after the failure of a rupture disk or breaking pin is cleaned and operates properly before the next cargo is loaded into the tank.

§ 153.1502 Fixed ballast relocation.

No person may remove or relocate fixed ballast unless—

(a) the change is approved by the Commandant (G–MMT); or

(b) the ballast is temporarily moved under the supervision of a Coast Guard Marine Inspector for examination or repair of the tankship.

§ 153.1504 Inspection of personnel emergency and safety equipment.

The master shall ensure that the personnel emergency and safety equipment required by § 153.214 is inspected each 30 days and found to be in good condition and operating properly.

APPENDIX I—LIST OF CARGOES NOT REGULATED UNDER PART 153 OR SUBCHAPTER D

Table II—Bulk liquid cargoes that may be carried in vessels having neither a Certificate of Inspection under subchapter D (Tank Vessels) nor a Letter of Compliance under this part are the following:

Ammonium nitrate, urea, water solution, 2% or less NH_3
Calcium chloride in water
2-chloro-4-ethylamino- 6 -isopropylamino-5-triazine, water solution
Hexamethylene diamine adipate
Lignin liquor (calcium ligno-sulfonate, water solution)
Magnesium hydroxide suspensions in water
Methyl chloroform (1, 1, 1-trichoroethane)
Molasses
Pentasodium salt of diethylene triamine pentaacetic acid, water solution
Perchloroethylene
Sodium lignosulfonates, sodium hydroxide (not exceeding 1% by weight), water solution
Sorbital in water
Tetrasodium salt of ethylene diamine tetraacetic acid, water solution
Urea in water
Water
Mixtures solely of the cargoes in this list.

APPENDIX II (RESERVED)

APPENDIX III.—*Metric units used in pt. 153*

Parameter	Metric (SI unit)	Abbreviation	Equivalent to English or common metric
Length..	Meter.....	m	39.37 in.
	Centimeter.....	cm	.3937 in.
Volume..	Cubic meter...	m^3	264 gallons (gal).
	....do.....	m^3	35.3 ft^3.
Temperature.	Degree Celsius.	°C	5/9(° F–32).
Force....	Newton.....	N	0.225 lbs.
Pressure.	Pascal.....	Pa	1.450×10^{-4} lbs/in^2.
	Kilo-Pascal (1,000 Pascals).	kPa	0.145 lbs/in^2.
	Kilo-Pascal....	kPa	1×10^{-2} kg/cm^2.
	....do.....	kPa	1×10^3 N/m^2.

(R. S. 4472, as amended (46 U.S.C. 170); sec. 201, 86 Stat. 427, as amended (46 U.S.C. 391a); sec. 6(b)(1), 80 Stat. 937 (49 U.S.C. 1655(b)(1); 49 CFR 1.46 (b), (t), (n)(4).)

NOTE.—The Coast Guard has determined that this document does not contain a major proposal requiring preparation of an Economic Impact Statement under Executive Order 11821, as amended, and OMB Circular A–107.

Dated: September 20, 1977.

O. W. SILER,
Admiral, U.S. Coast Guard
Commandant.

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